SUPERIOR
Manufacturing & Hydraulics

TECHNICAL MANUAL

15" HYDRAULIC TONG POSITIONER SYSTEM

COVERS

TONG MODEL CLE14000DP01

BACKUP MODEL BUCDP15000

HYTOPS™ MODEL HYTOPS15000

4225 Highway 90, East
Broussard, Louisiana 70518
Phone: (337) 837-8847
Fax: (337) 837-8839
www.superior-manf.com

Published 04/2003

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This manual is not a controlled document and is subject to revision without notice. To receive updates and insure you have access to the latest information concerning the 15" Hydraulic Tong Positioner System, we request you complete this form and return the lower half to SUPERIOR Manufacturing and Hydraulics by mail or facsimile.

Name: _____
Company: _____
Address: _____
Address: _____
City: _____ **State:** _____
Postal Code: _____ **Country:** _____
Telephone: _____ **Fax:** _____

Tong Model No.: _____ **Serial No.:** _____
Backup Model No.: _____ **Serial No.:** _____
Assembly Date: _____

15" Hydraulic Tong Positioner System
Technical Manual Registration Form

Name: _____
Company: _____
Address: _____
Address: _____
City: _____ **State:** _____
Postal Code: _____ **Country:** _____
Telephone: _____ **Fax:** _____

Tong Model No.: _____ **Serial No.:** _____
Backup Model No.: _____ **Serial No.:** _____
Assembly Date: _____

Return To:

SUPERIOR Mfg. & Hyd.
4225 Hwy. 90 East
Broussard, LA 70518
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15" Hydraulic Tong Positioner System

REVISION TABLE

Section	*Page*	*Date*	*Description*
1	2	11/20/03	Last paragraph.
2	2	11/20/03	Paragraphs 4 & 5.
	5	11/20/03	Added Maximum Torque availability in 100,000 ft.lbs.
	7-8	11/20/03	Added Dimension Illustrations.
5	1	11/20/03	Suspension: Removed A) & D), renumbered.
	3	11/20/03	Revised Initial Setup Guidelines.
	6-12	11/20/03	Removed Ref. Fig. & Item notations and pipe rack instructions.
9	25 & 26	11/20/03	Revised Illustrations Left Jaw Adapter Assy. & Right Jaw Adapter Assy.
12	1-6	11/20/03	Revised Table of Contents. Added Schematic & Components List.
13	1	11/20/03	Added 25 Sq. In. size to Compression Loadcell Type.
	3-8	11/20/03	Added Compression Torque System Manual, Draft 6.
15	All	11/20/03	Added Control Valve Tech. Data.
2	5	01/06	Added Specs for 100,000 ft/lb tong.
3	1	01/06	Revised Dovetail Pencil/Strip Die chart, added more sizes.
7	1	01/06	Added 32DU28 DU Bearings for LF Jaw Rollers.
9	1, 15, 19, 20, 25-26.2	01/06	Added Jaw Adapter 5 1/2" to 4 1/2" Assy. 14DPA-0525 & Jaw Adapter 9 5/8" to 8 5/8" Assy. 14DPA-9625. Revised Remote Shift Cyl. Assy. 14722, Open Throat Cam Positioner Assy. 73165, Left & Right Jaw Adapter Assy. 14693 & 14694
10	8	01/06	Revised Valve Bank Assy.
Cover Title Pg.	Cover Title Pg.	05/07	Removed ISO emblems.
2	1		
3	7-12		
9	1, 8.1 5, 17, 19, 26.1, 27, 28, 31	05/07	Added illustration Idler Gear with Short Shaft Assy. Mfg. Starting 07/13/06, and 14" x 11 3/4" LF Splined Jaw Assy. CJ-LF-14X. Revised illustrations Gear Train Assy., Cage Plate Assy., Open Throat Cam Positioner Assy., 14" DP Jaw Adapter 5 1/2" to 4 1/2", DT Jaw Assy. CJDT76 & CJDT86, DT Jaw Assy. CJDT14X.
15	19-22	05/07	Added Illustration Denison Dump Valve and Electrical Connector Assy.
9	1, 10.1	02/08	Added Pinion Gear Assy. Mfg. 02/2008 Assy. No 26068-01.

15" HYDRAULIC TONG POSITIONER SYSTEM

HAZARD WARNING

Nomenclature used in this manual:

WARNING	concerns an operating procedure or practice that, if not strictly observed, can result in injury to personnel or loss of life.
Caution	concerns an operating procedure or practice that, if not strictly observed, can result in damage to or destruction of equipment.
Note	concerns an operating procedure or practice that needs highlighting.

CLINCHER® Tongs and Backups are manufactured to provide a means of making up or breaking out high torque tubular connections. They utilize high pressure hydraulic fluid power which can cause the tong to move suddenly and with great force if the tong is not properly rigged up and operated. **CLINCHER®** Tongs, Backups and Positioning System contain remotely controlled rotating and reciprocating parts which can severely or fatally injure personnel who are operating, repairing, or near this equipment during its operation. **WARNING: Tongs, Backups and Positioners are not to be operated by untrained personnel or personnel with diminished physical or mental capacity. No work of any type, including changing of dies, is to be carried out while the tong and backup are connected to any hydraulic or electric power unit.**

CLINCHER® Tongs and Backups are heavy tools. **WARNING: Users must insure the entire lifting system used to move this equipment including forklifts, cranes, cables, rig mounting points, lift cylinders, slings, winches, pulleys, etc., are capable of handling the static weight of the tong, backup and positioning system plus any loads which could be transferred to it during handling.**

WARNING: Operating the Tong without locking the Backup on the tubular can cause dangerous and unexpected movement of the entire system causing severe equipment damage and causing personnel injury or death. Users must provide a means of safely controlling the tong movements in all directions when it is in use. Failure to account for its size, weight, movement and amount of torque developed could result in personnel injury or death.

CLINCHER® Tongs and Backups utilize high pressure hydraulic fluids. Portions of the tong and backup, control valves, hydraulic lines and cylinders may contain high pressure fluid even when the power unit is de-energized and the fluid supply hoses are disconnected. During normal operation the temperature of the hydraulic fluids as well as hoses, piping, valves, etc., can rise to a level which can cause burns. **WARNING: Personal protective gear including safety glasses, face shields, protective gloves and protective clothing must be worn to guard against the hazards of high pressure fluids. Tight fitting clothing is required to prevent entanglement in rotating components. These tools should be serviced by thoroughly trained and qualified hydraulic technicians using procedures to safely insure hydraulic pressure is bled from these circuits.**

15" HYDRAULIC TONG POSITIONER SYSTEM

HAZARD WARNING

WARNING: Attempting to operate this unit with a power unit designed for open center valves will result in the power unit operating continuously at maximum pressure, will cause overheating, and may cause equipment failures possibly exposing personnel to high pressure, high temperature hydraulic fluid leaks.

The **CLINCHER®** Tong is equipped with a door interlock system which prevents tong rotation whenever the door is open. This system is to be tested before each mobilization and at every shift change. Should this system be determined to be inoperative, the tong is to be removed from service and tagged as ***in-operative*** until repairs are made. **CAUTION:** Operating the tong with the door in the open position could result in severe damage to the equipment and will void all manufacturer warranties. **WARNING: Operating the tong with the door open by means of a defective or bypassed door interlock system exposes the operator and nearby personnel to potentially fatal hazards.**

No attempt should be made to operate the **CLINCHER®** Tong and Backup for any purpose other than which it is intended. This system is capable of generating very large clamping forces and torsional loads which, if improperly applied or controlled, could result in damage to the tubular, to the tong or backup, or could possibly result in injury or death of personnel. Do not attempt to operate the unit without correct dies and the proper size tubular being in the tong and backup. See Section 3 for more information concerning the selection and use of dies. **CAUTION: Operating this equipment without the correct size, type, and orientation of dies can result in damage to the equipment or tubulars being handled.**

The Positioner can move the Tong vertically and horizontally.. **WARNING: Personnel must remain a minimum 3 foot distance when the unit is being repositioned or operated.**

HYDRAULIC PRODUCT SAFETY

WARNING: Valve lever (spool) may "stick" (not center) under certain conditions allowing the hydraulic equipment to continue to operate and could cause serious injury, death or equipment failure.

VALVE SAFETY: Read and follow instructions carefully. Failure to observe instructions and guidelines may cause serious injury, death or equipment failure. A sticking valve (spool bind) may be caused by one or more of the following factors:

DIRTY OIL: Oil must be filtered to a minimum of 25 microns. Filters should be changed regularly - spin-on types after 50 hours of initial use and then after every two hundred fifty hours of use. Use of a condition indicator is recommended. Consult your tractor or implement owner's manual for filtration and changing recommendations for internal systems.

OIL REQUIREMENTS: Premium quality anti-wear type oil with a viscosity between 100 and 200 SSU at operating temperatures. Certain synthetic oils may cause spool seals to swell and the valve to stick. If in doubt, call CROSS Engineering.

IMPROPER HOOK UP OR MOUNTING: Always use the proper size fittings. Hook up "in" & "out" as noted on the valve body. Do not overtorque pipe fittings. Mounting surfaces should be flat and care should be used when tightening mounting bolts. Over-tightened bolts can cause spool bind and casting breakage. When hooking a valve in series, always use a power beyond sleeve. Consult your tractor or implement manual to make sure you have the proper quick disconnect line connected to the inlet of the remote valve.

MISAPPLICATION: Always use the proper valve for the job. CONVERTA, CD, CS or CA valves should never be used for metered heavy load lifting - loaders or similar applications. Use an open center valve for open center applications and a closed center valve for closed applications. If in doubt, check with your tractor dealer. Contact CROSS if the valve allows the hydraulic equipment to creep excessively.

MAINTENANCE: Make sure all bolts are tightened and torqued to the recommended specification. Bent or broken parts should not be used. Replace immediately. Always use exact replacements. Always protect valve spool from paint overspray.

Faulty quick disconnects can cause high back pressures and sticking spools. Check quick disconnects periodically to make sure they are functioning properly. If valve spool does not center or appears to stick, do not use!

PUMPS & MOTORS SAFETY:

A relief or bypass in your hydraulic system is necessary to prevent pump from breakage due to overpressurization. Use correct fittings and proper oil as noted in the technical service manual packed with each unit. Change oil as recommended by your implement or tractor manufacturer.

CYLINDER SAFETY:

Check clevis clearances before, during and after extending the cylinder and before using the cylinder under pressure to avoid possible injury, or bent or broken rods caused by binding. Never operate a cylinder above recommended pressures. Never use a cylinder as a safety device when transporting equipment.

PINHOLE LEAKS:

If you observe a pinhole leak, discontinue use of the component. If oil has penetrated your skin or contacted your eye, seek medical attention immediately!

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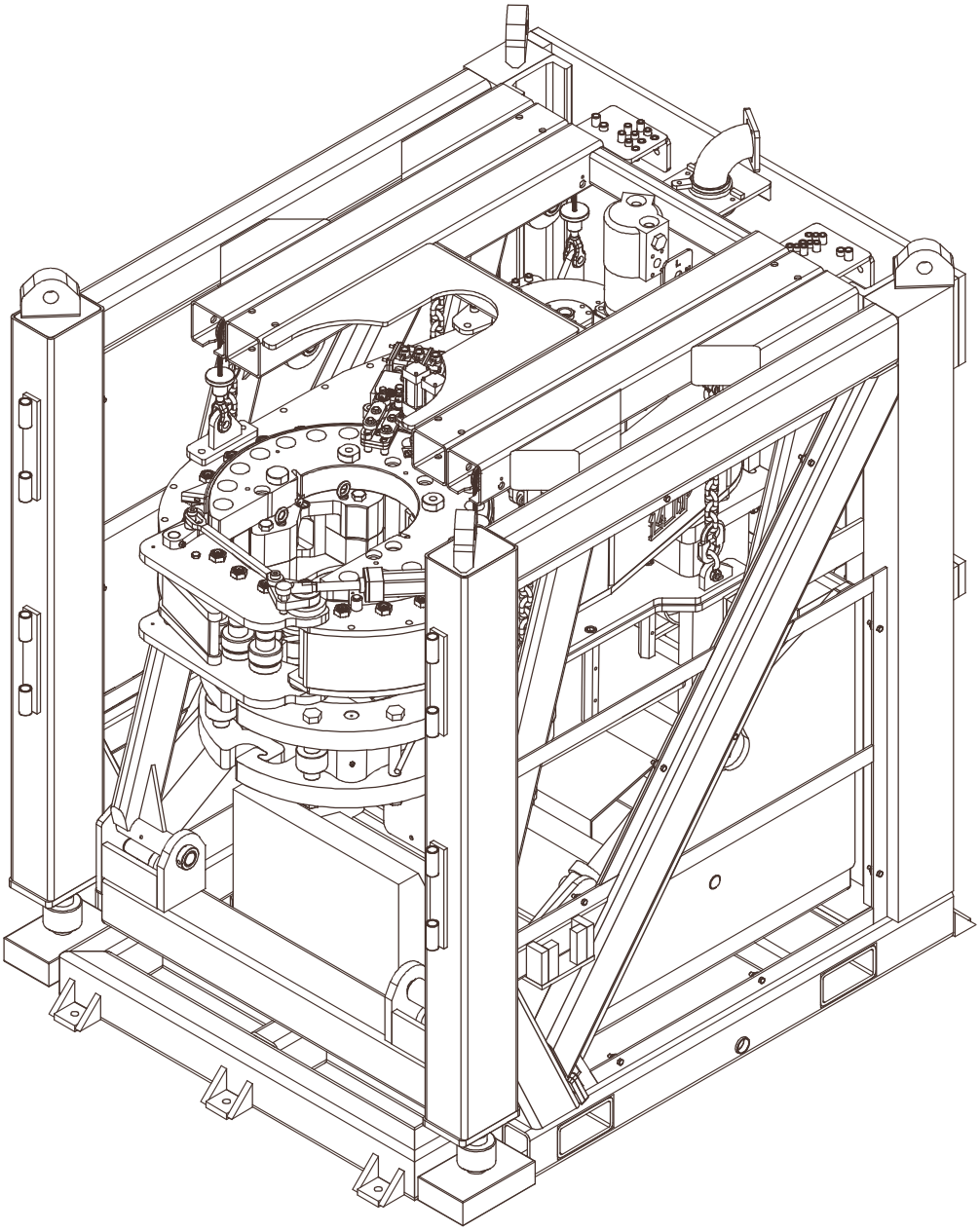


14" CLINCHER® DRILL PIPE COMBO TONG
AND
15" LOCKJAW™ DRILL PIPE BACKUP

4225 Highway 90, East
Broussard, Louisiana 70518
Phone: (337) 837-8847
Fax: (337) 837-8839
www.superior-manf.com

GENERAL DESCRIPTION and APPLICATION

The **CLINCHER®** products described in this manual allow "Hands Off" stabbing, make-up or break-out of casing, tubing, or drill pipe in the vertical position. Products covered in this manual include:

1. CLE14000DP01 **CLINCHER®** 14" Remotely Operated Drill Pipe Combo Tong
2. BUCDP15000 **CLINCHER®** 15" Remotely Operated **LOCKJAW™** Drill Pipe Backup
3. HYTOPS15000 **CLINCHER®** Tong Positioning System
4. Instrument and Control Systems for Tong, Backup & Positioner

The CLE14000DP01 Tong is a remotely operated high torque hydraulic tong capable of handling tubulars ranging from 4 1/2" to 14" in diameter. It is provided with Hydraulically Operated Tong Door Actuator, Hi/Lo Gear Shifter, Motor Speed and Make/Break Backing Pin Controls. Additionally, a Cage Plate Position Sensor and Control System simplify remote operation by automatically stopping reverse rotation of the Cage Plate in the open throat position.

The BUCDP15000 **LOCKJAW™** Backup is a remotely operated high torque hydraulic backup which fully encircles the tubulars to compliment the tong during make-up and break-out operations. Its patented **LOCKJAW™** geometry provides maximum structural strength in the smallest possible package with minimal moving parts. It features a door position sensor to limit the amount of clamping force developed if inadvertently used on oversized tubulars which prevent full door closing/locking.

The HYTOPS15000 Positioning System is a self contained structure with actuators which can move the tong in two axis. This system can be used on the rig floor to make/break tubulars while RIH or POH. It can be used off-line for building/breaking down BHA or strands of tubulars. Installation requires coupling supply, return and control circuit hydraulic hoses. Removal is as quick and easy as installation. Additionally, the Positioning System functions as a shipping skid for the tong and backup.

The instrument and control system is mounted in a stainless steel enclosure. The control system is detached from the positioning system and is latched into a storage frame in the power unit when not in use. When operating, the control system is attached to either side near the front of the positioner.

DESCRIPTION and APPLICATION

The **CLINCHER®** Tong and Backup system is an "open-throat" design which can handle tubulars as small as 4 1/2 inches to as large as 14 inches in diameter. The Backup can accommodate tubulars as large as 15 inches. This system features two (2) jaws in the Tong and three (3) in the Backup which encircle the pipe. Wrap Around jaws and dies, combined with our low friction jaw technology and constant radial load cam system provide exceptional gripping capabilities with reduced pipe deformation, stress, and marking. Using our non-marking aluminum die system or **GRIT FACE™** dies in the Tong and Backup will now allow stainless steel corrosion resistant alloys (CRA) to be run as quickly and easily as a traditional tong runs conventional steel tubulars.

Notable Features and Benefits

Low Friction Jaws	increases cam angle efficiency to allow use of aluminum dies
Splined Die System	aligns the die with the tubular and more evenly distributes radial load, essentially wrapping the die around the tube reduces pipe stress, deformation, and minimizes marking
Constant Cam Angle	insures an adequate radial load is available regardless of relative rotation to enhance performance on undersized pipe
Die Retention Method	provides an enhanced method of preventing equipment damage and die loss if the pipe is inadvertently moved while the tong is still gripping the pipe
Self Adjusting Brake	eliminates need to manually adjust brake bands to compensate for normal wear

In addition to these unique features listed above, the **CLINCHER®** Tong and Backup System is also equipped with numerous standard features including:

Door Interlock	prevents tong ring gear rotation whenever the tong door is open but allows control and operation of the Backup and lift cylinder at all times
Encoder Adapter	accepts customer=s turns encoder to signal to a torque/turn computer
Pressure Control Valve	adjustable pressure control valves allow the customer to limit the amount of pressure applied and torque developed

The features described above are covered by US and foreign patents or pending US and foreign patents.

DESCRIPTION and APPLICATION

Tong Application

After completing the makeup or breakout cycle the jaws are opened by reversing the tong motor to drive the ring gear and cam surfaces in the opposite direction until the reversing pin contacts the ring gear shoulder. Springs are used to return the jaws to their fully open position.

The cage plate assembly and jaws are rotationally restrained by the cage plate brake system. Relative rotation between the ring gear and the cage plate assembly forces the front jaws to lock or unlock and the rear jaw to advance or retract.

During a jaw closing cycle, the jaws advance until they contact the pipe. After completing the makeup or breakout cycle, the jaws are opened by reversing the tong motor to drive the ring gear and cam surfaces in the opposite direction until the reversing pin contacts the ring gear shoulder. Springs are used to return the jaws to their fully open position.

The tong=s cage plate braking system is self adjusting to compensate for brake band wear. Field adjustments are not required under normal conditions.

Backup Application

The **CLINCHER® LOCKJAW™** Backup has an "open throat" design with three jaws that encircle the pipe. The front jaws are Cam operated by the rear cylinder. Once locked on the pipe, pressure is locked in the backup cylinder by a load holding valve. When opening the backup jaws, the cylinder operation is reversed to retract the rear die and unlock the jaws. Springs move the front jaws to their fully open position.

SPECIFICATIONS
TONG, BACKUP, & SUSPENSION SYSTEM
14" TONG, 15" BACKUP & 15" HYTOPS™

Maximum Torque **Also Available**	80,000 ft.lbs. / 108,465.6 N-m 100,000 ft.lbs. / 135,582 N-m	
Maximum Operating Pressure / Tong **Maximum Operating Pressure / Backup**	3,000 psi / 207 bar 3,000 psi / 207 bar	2,500 psi / 172.5 bar 2,500 psi / 172.5 bar
Maximum Allowable Flow Rate 68 GPM / 257 LPM **Manual Gearbox with 2-Speed Hydraulic Motor** **High Gear / High Speed** **High Gear / Low Speed** **Low Gear / High Speed** **Low Gear / Low Speed**	3,000 psi 49.9 RPM 24.9 RPM 9.2 RPM 4.6 RPM	2,500 psi 40.2 RPM 20.1 RPM 7.4 RPM 3.7 RPM
Handle Length / Tong	49 1/2" / 125.7 cm	
Handle Length / Backup	38 13/16" / 98.6 cm	
Overall Length / Tong, Backup & MK	74 3/8" / 188.9 cm	
Overall Width / Tong & Backup (Includes Handles)	48 1/2" / 123.2 cm	
Weight / Tong w/Mounting Kit **Weight / Backup** **Combined Weight / Tong, Backup & MK**	4400 lbs. / 1995.8 kg 2800 lbs. / 1270.0 kg 7200 lbs. / 3265.8 kg	
Jaw Capacity / Tong **Jaw Capacity / Backup**	4 1/2" thru 14" 4 1/2" thru 15"	
Gripping Range **Dovetail Jaws & Adaptors Only**	1/2" under nominal size	

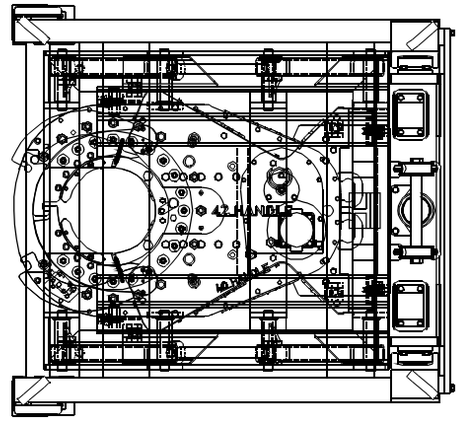
Operates using Dovetail Strip Dies, Steel Tooth Wrap Around Dies, **GRIT FACE™** Wrap Around Dies, and Aluminum Wrap Around Dies.

Standard Equipment:

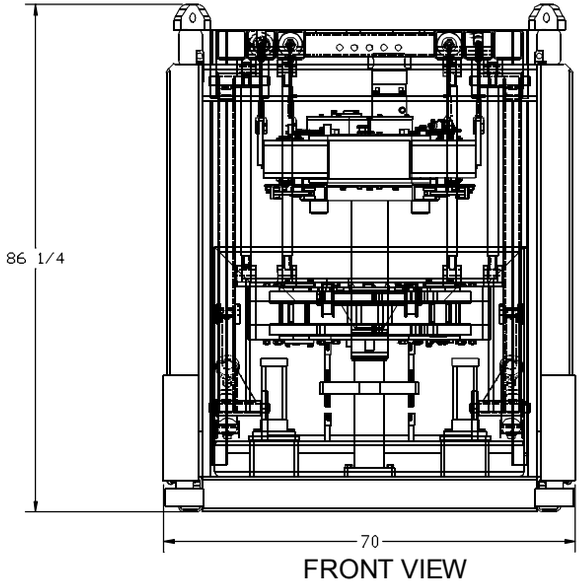
- Door Interlock
- Two Speed Hydraulic Motor
- Hydraulic Cage Plate Brake System

Optional Equipment:

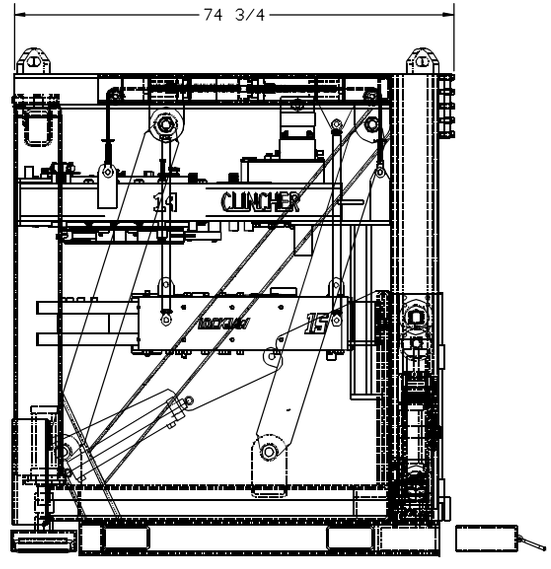
- Two Speed Gear Box
- Electronic Solenoid Dump Valve
- Hydraulic Intensifier for Backup
- Shipping Stand, or Skid
- Varying Outlets for Torque Turns Computer Sending Units



TOP VIEW



FRONT VIEW



SIDE VIEW

Rev.#	By	Log#	Description of Revision
6			
5			
4			
3			
2			
1			

1/8 LS STAMP P/N & W.O ON NON-CRITICAL SURFACE

ETCH P/N & W.O ON NON-CRITICAL SURFACE

T-G P/N & W.O

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE — R6

2 PLACE DEC.	3 PLACE DEC.	FRACTIONS	ANGLES	SURFACE 250	FLATNESS AR PL.
±.020	±.005	± 1/16	± .5°		± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

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△1 =Revision No. X =STAMP,ETCH,TAG =Machine Zero

1.000 = Critical Dimension 100% Inspection Required

SHEET 1 of 1

SUPERIOR Manufacturing & Hydraulics
4225 HWY.90 E
BROUSSARD,LA 70518
(318)837-8847

PART NAME: OVERALL DIMENSIONS FOR 15" HYDRAULIC TONG POSITIONER SYSTEM

PART #:

DRAWN BY: NING M

APPROVED BY: DAN B

CHK BY: NM DATE: 8-2-99

REF: F:\MANUALS\HYTOPS15000\OVERALL

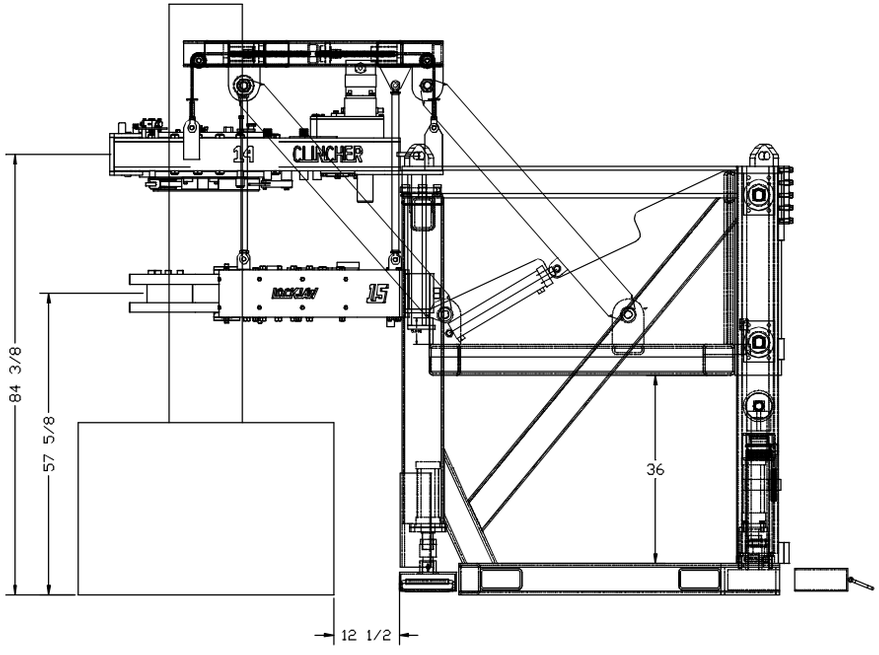
MATERIAL SPECIFICATION

Matl.Req:

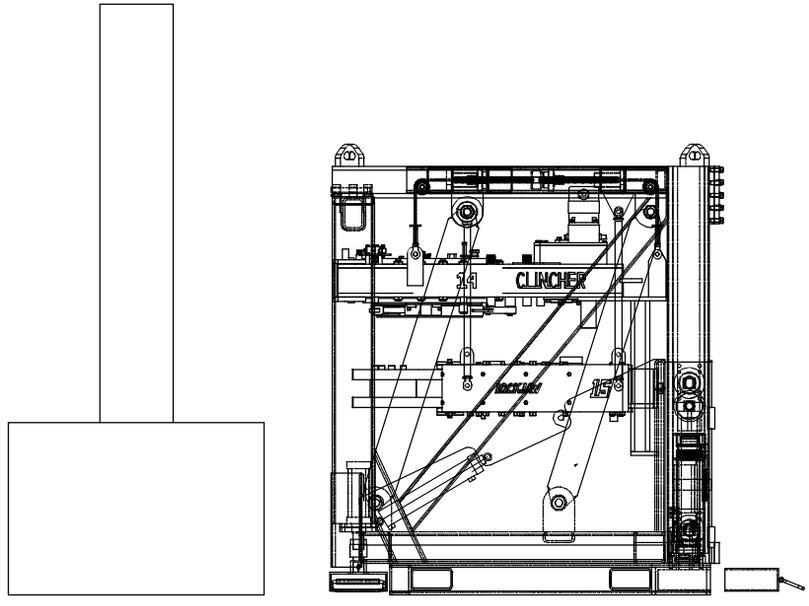
Initial Condition:

Alternate Matl:

H.T Instructions: Case Depth:



SIDE VIEW
(SHOWN IN HIGHEST POSTION)



SIDE VIEW
(SHOWN IN LOWEST POSTION)

Rev.#	By	Log#	Description of Revision
6			
5			
4			
3			
2			
1			

1/8 LS STAMP P/N & W.O ON NON-CRITICAL SURFACE

ETCH P/N & W.O ON NON-CRITICAL SURFACE

TAG P/N & W.O

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE — R6

2 PLACE DEC.	3 PLACE DEC.	FRACTIONS	ANGLES	SURFACE	FLATNESS AR PL.
±.020	±.005	± 1/16	± .5°	250	± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

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△1 =Revision No. X =STAMP,ETCH,TAG =Machine Zero

1.000 = Critical Dimension 100% Inspection Required

SHEET 1 of 1

SUPERIOR Manufacturing & Hydraulics
4225 HWY.90 E
BROUSSARD,LA 70518
(318)837-8847

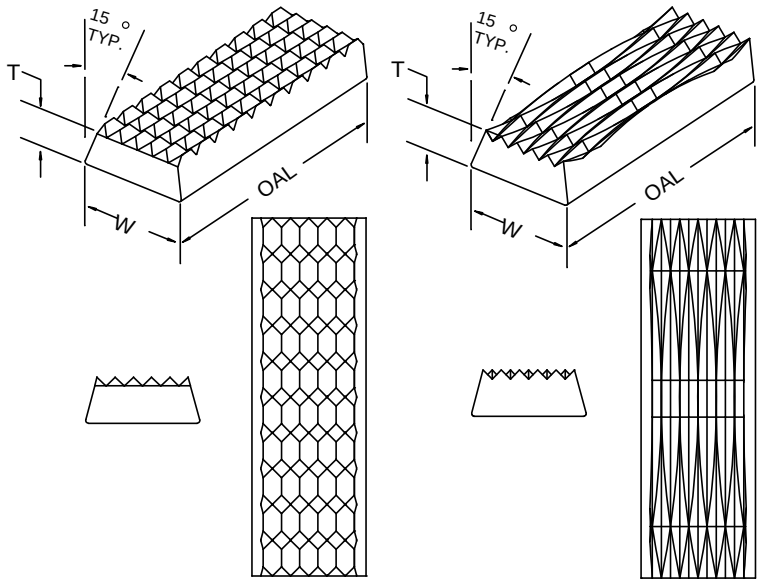
PART NAME: ILLUSTRATION HIGHEST & LOWEST POSITION FOR 15" HYDRAULIC TONG POSITIONER SYSTEM

PART #:	MATERIAL SPECIFICATION
DRAWN BY: NING M	Matl.Req:
APPROVED BY: DAN B	Initial Condition:
CHK BY: NM DATE: 8-2-99	Alternate Matl:
REF: F:\MANUALS\HYTOPS15000\OVERALL	H.T Instructions: Case Depth:

CLINCHER® DIES

Many **CLINCHER®** Tongs and Backups utilize jaws and/or adapters which accept Dovetail Inserts (AKA Pencil Dies or Strip Dies) to effectively grip tubulars. Jaw systems and jaw adapters are also available which accommodate Wrap-Around Fine Tooth Steel Dies, **GRIT FACE™** Dies and Aluminum Dies. The drawings in this section describe the jaw and adapter systems.

The appropriate jaws, die adapters and dies required for a specific tubular OD are also described in this section of the manual.



STRAIGHT TOOTH **DIAMOND TOOTH**

Note: Diamond Tooth Dies are used when a more aggressive bite is required.

Thickness	Width	OAL	P/N Straight Tooth	P/N Diamond Tooth
5/16	5/8	3 1/2	★	★
5/16	5/8	3 7/8	DTI4052	★
5/16	5/8	4 1/2	DTI4002	★
3/8	5/8	3 1/2	DTI4030	★
3/8	5/8	3 7/8	DTI4051	★
3/8	5/8	4 1/2	DTI4001	★

Thickness	Width	OAL	P/N Straight Tooth	P/N Diamond Tooth
17/32	5/8	3 1/2	DTI4031	★
17/32	5/8	3 7/8	DTI4053	★
17/32	5/8	4 1/2	DTI4003	★
5/8	5/8	3 1/2	DTI4032	★
5/8	5/8	3 7/8	DTI4054	★
5/8	5/8	4 1/2	DTI4004	★
11/16	5/8	3 7/8	DTI4055	★
11/16	5/8	4 1/2	DTI4005	★
3/8	1	3 7/8	DTI1505	★
3/8	1 1/4	3 7/8	DTI1614	★
3/8	1 1/4	5	DTI1610	★
7/16	1 1/4	3 7/8	DTI1612	DTI1612D
7/16	1 1/4	5	DTI1617	DTI1617D
1/2	1 1/4	3 7/8	DTI1601	DTI1601D
1/2	1 1/4	5	DTI1602	DTI1602D
9/16	1 1/4	3 7/8	DTI1622	DTI1622D
9/16	1 1/4	5	DTI1623	DTI1623D
5/8	1 1/4	3 7/8	DTI1632	DTI1632D
5/8	1 1/4	5	DTI1633	★
11/16	1 1/4	3 7/8	DTI1642	★
11/16	1 1/4	5	DTI1646	★
3/4	1 1/4	3 7/8	DTI1651	★
3/4	1 1/4	5	DTI1693	★
3/4	1 1/4	5 7/8	DTI1662	DTI1662D
13/16	1 1/4	3 7/8	DTI1661	★
13/16	1 1/4	5	DTI1664	★
7/8	1 1/4	3 7/8	DTI1671	★
7/8	1 1/4	5	DTI1673	★
1	1 1/4	3 7/8	DTI1691	★
1	1 1/4	5	DTI1697	★

★ Available upon request.

CLINCHER® WRAP AROUND DIES

CLINCHER® Wrap-Around Dies are available in three types:

Fine Toothed Steel Dies:	for low to ultra high torque applications on carbon steel tubulars including tubing, casing, and drill pipe
Smooth Faced Aluminum Dies:	for low to moderate torque applications on fiberglass and corrosion resistant alloy (stainless steel) tubulars
GRIT FACE™ Dies:	for low to high torque applications on fiberglass and corrosion resistant alloy (stainless steel) tubulars where the use of steel dies is prohibited as well as on carbon steel tubulars where reduced marking is desired

CLINCHER® Dies are designed to match the OD of the tubing, casing, coupling, or accessory being made up or broken out. Each die is stamped on the top or side to identify its size. Using Fine Toothed Steel Dies which are slightly larger than the tubular is acceptable provided the difference in diameters is less than 3/32" (0.093"). Aluminum and **GRIT FACE™** Dies should be matched with the specific tubular diameters required. **Note:** The use of improperly sized dies can result in reduced torque capacity, increased pipe marking, and reduced die life.

CAUTION: Do not attempt to grip tubular diameters which are larger than the dies being used. Failure to observe this precaution can result in damage to the tubular, tong or backup jaws, or backup door plates.

In emergencies where correct die sizes are unavailable, some operators have successfully used two different sizes of dies to accommodate unusual, nonstandard diameters.

CLINCHER® Wrap-Around Dies are manufactured in specific diameters to match standard tubing and casing diameters, API coupling diameters, selected work string connection diameters and certain commonly used premium connection coupling diameters. **CLINCHER®** Wrap-Around Dies should not be used on tubulars which are larger than the nominal die size. Steel Toothed Dies can be used on tubulars which are no smaller than 3/32" (0.093") less than the nominal die size. Aluminum and **GRIT FACE™** Dies should be matched with the specific tubular diameters required.

Note: Fine Toothed Steel Dies are normally stocked in our Broussard, Louisiana facility. Aluminum and **GRIT FACE™** Dies are normally made to order although a limited range of sizes and small quantities may be available from stock. Contact SUPERIOR Manufacturing & Hydraulics for information concerning availability of stock and special die sizes.

JAWS & ADAPTERS WITH DOVETAIL DIES for CLE14000DP and BUCS15000

Ref Line No	Qty Reqd	Unit	Tubular Product &Tong or Backup Components	Description	CLINCHER® Strip Die Jaw or Adapter Assembly Part Number (Note 2)	DOVETAIL Jaw Part Number	CLINCHER® DOVETAIL or Wraparound Die Part Number	standard dovetail die thickness required	dovetail die overall length required		nominal jaw & adapter sizes	dovetail die part number for 3 7/8" overall length>	DTI1661	DTI1651	DTI1642	DTI1632	DTI1622	DTI1601	DTI1612
												dovetail die part number for 5" overall length>	DTI1664	DTI1693	DTI1646	DTI1633	DTI1623	DTI1602	DTI1617
												dovetail die thickness>	13/16	3/4	11/16	5/8	9/16	**1/2**	7/16
											Inserts required for standard tubular diameters shown in bold font. REPLACEMENT DOVETAIL INSERTS for TONG JAWS are 1 1/4" wide x 5" long (4 pcs required per tong jaw set). REPLACEMENT DOVETAIL INSERTS for BACKUP DOVETAIL DIE ADAPTERS are 1 1/4" wide x 3 7/8" long (6 pcs required per backup dovetail die adapter set.)								
			8 5/8" casing																
1a	1	set of 2 pcs	tong jaw	8 5/8" tong jaw set w/ 1/2" dovetail strip dies	CJDT86-08625	86014-08625	DTI 1602	1/2	5		8.625	dovetail gripping size>	8.000	8.125	8.250	8.375	8.500	**8.625**	8.750
1b	3	each	backup die f/ tubular	15 x 8 5/8 splined adapter w/ 1/2" dovetail strip dies	BUDT15-08625	see Note 3	DTI 1601	1/2	3 7/8		8.625	dovetail gripping size>	8.000	8.125	8.250	8.375	8.500	**8.625**	8.750
1c	3	each	backup die f/ 9 5/8" OD API coupling	9 5/8 die for 15" adapter w/ 1/2" dovetail strip dies	BUDT15-09625		DTI 1601	1/2	3 7/8		9.625	wrap around die size>	9.000	9.125	9.250	9.375	9.500	**9.625**	9.750
			8" tool joints																
2a	1	set of 2 pcs	tong jaw	8" tong jaw set w/ 1/2" dovetail strip dies	CJDT86-08000	86014-08000	DTI 1602	1/2	5		8.000	dovetail gripping size>	7.375	7.500	7.625	7.750	7.875	**8.000**	8.125
2b	3	each	backup die adapter	15 x 8 splined adapter w/ 1/2" dovetail strip dies	BUDT15-08000	see Note 3	DTI 1601	1/2	3 7/8		8.000	dovetail gripping size>	7.375	7.500	7.625	7.750	7.875	**8.000**	8.125
			7 13/16" tool joints																
3a	1	set of 2 pcs	tong jaw f/ tool joint	7 13/16" tong jaw set w/ 1/2" dovetail strip dies	CJDT76-07812	73014-07812	DTI 1602	1/2	5		7.812	dovetail gripping size>	7.187	7.312	7.437	7.562	7.687	**7.812**	7.937
3b	3	each	backup die adapter	15 x 7 13/16 splined adapter w/ 1/2" dovetail strip dies	BUDT15-07812	see Note 3	DTI 1601	1/2	3 7/8		7.812	dovetail gripping size>	7.187	7.312	7.437	7.562	7.687	**7.812**	7.937
			7 5/8" casing																
4a	1	set of 2 pcs	tong jaw	7 5/8" tong jaw set w/ 1/2" dovetail strip dies	CJDT76-07625	73014-07625	DTI 1602	1/2	5		7.625	dovetail gripping size>	7.000	7.125	7.250	7.375	7.500	**7.625**	7.750
4b	3	each	backup die f/ tubular	15 x 7 5/8 splined adapter w/ 1/2" dovetail strip dies	BUDT15-07625		DTI 1601	1/2	3 7/8		7.625	dovetail gripping size>	7.000	7.125	7.250	7.375	7.500	**7.625**	7.750
4c	3	each	backup die f/ 8 1/2" OD API coupling	8 1/2" die for 15" adapter w/ 1/2" dovetail strip dies	BUDT15-08500		DTI 1601	1/2	3 7/8		8.500	dovetail gripping size>	7.875	8.000	8.125	8.250	8.375	**8.500**	8.625
			7 1/2" tool joints																
5a	1	set of 2 pcs	tong jaw	7 1/2" tong jaw set w/ 1/2" dovetail strip dies	CJDT76-07500	73014-07500	DTI 1602	1/2	5		7.500	dovetail gripping size>	6.875	7.000	7.125	7.250	7.375	**7.500**	7.625
5b	3	each	backup die adapter	15 x 7 1/2 splined adapter w/ 1/2" dovetail strip dies	BUDT15-07500		DTI 1601	1/2	3 7/8		7.500	dovetail gripping size>	6.875	7.000	7.125	7.250	7.375	**7.500**	7.625
			7 1/4" tool joints																
6a	1	set of 2 pcs	tong jaw	7 1/4" tong jaw set w/ 1/2" dovetail strip dies	CJDT76-07250	73014-07250	DTI 1602	1/2	5		7.250	dovetail gripping size>	6.625	6.750	6.875	7.000	7.125	**7.250**	7.375
6b	3	each	backup die adapter	15 x 7 1/4 splined adapter w/ 1/2" dovetail strip dies	BUDT15-07250		DTI 1601	1/2	3 7/8		7.250	dovetail gripping size>	6.625	6.750	6.875	7.000	7.125	**7.250**	7.375
			7" casing																
7a	1	set of 2 pcs	tong jaw	7" tong jaw set w/ 1/2" dovetail strip dies	CJDT76-07000	73014-07000	DTI 1602	1/2	5		7.000	dovetail gripping size>	6.375	6.500	6.625	6.750	6.875	**7.000**	7.125
7b	3	each	backup die f/ tubular	15 x 7 splined adapter w/ 1/2" dovetail strip dies	BUDT15-07000		DTI 1601	1/2	3 7/8		7.000	dovetail gripping size>	6.375	6.500	6.625	6.750	6.875	**7.000**	7.125
7c	3	each	backup die f/ 7.656" OD API coupling	7.656" die for 15" adapter w/ 1/2" dovetail strip dies	BUDT15-07656		DTI 1601	1/2	3 7/8		7.656	dovetail gripping size>	7.031	7.156	7.281	7.406	7.531	**7.656**	7.781
			6 5/8" casing																
8a	1	set of 2 pcs	tong jaw	6 5/8" tong jaw set w/ 1/2" dovetail strip dies	CJDT76-06625	73014-06625	DTI 1602	1/2	5		6.625	dovetail gripping size>	6.000	6.125	6.250	6.375	6.500	**6.625**	6.750
8b	3	each	backup die f/ tubular	15 x 6 5/8 splined adapter w/ 1/2" dovetail strip dies	BUDT15-06625		DTI 1601	1/2	3 7/8		6.625	dovetail gripping size>	6.000	6.125	6.250	6.375	6.500	**6.625**	6.750
8c	3	each	backup die f/ 7.390" OD API coupling	7.390" die for 15" adapter w/ 1/2" dovetail strip dies	BUDT15-07390		DTI 1601	1/2	3 7/8		7.390	dovetail gripping size>	6.765	6.890	7.015	7.140	7.265	**7.390**	7.515
			6 1/2" tool joint																
9a	1	set of 2 pcs	tong jaw	6 1/2" tong jaw set w/ 1/2" dovetail strip dies	CJDT76-06500	73014-06500	DTI 1602	1/2	5		6.500	dovetail gripping size>	5.875	6.000	6.125	6.250	6.375	**6.500**	6.625
9b	3	each	backup die adapter	15 x 6 1/2 splined adapter w/ 1/2" dovetail strip dies	BUDT15-06500		DTI 1601	1/2	3 7/8		6.500	dovetail gripping size>	5.875	6.000	6.125	6.250	6.375	**6.500**	6.625
			6 3/8" tool joint																
10a	1	set of 2 pcs	tong jaw	6 3/8" tong jaw set w/ 1/2" dovetail strip dies	CJDT76-06375	73014-06375	DTI 1602	1/2	5		6.375	dovetail gripping size>	5.750	5.875	6.000	6.125	6.250	**6.375**	6.500
10b	3	each	backup die apapter	15 x 6 3/8 splined adapter w/ 1/2" dovetail strip dies	BUDT15-06375		DTI 1601	1/2	3 7/8		6.375	dovetail gripping size>	5.750	5.875	6.000	6.125	6.250	**6.375**	6.500
			6 1/4" tool joint																
11a	1	set of 2 pcs	tong jaw	6 1/4" tong jaw set w/ 1/2" dovetail strip dies	CJDT76-06250	73014-06250	DTI 1602	1/2	5		6.250	dovetail gripping size>	5.625	5.750	5.875	6.000	6.125	**6.250**	6.375
11b	3	each	backup die adapter	15 x 6 1/4 splined adapter w/ 1/2" dovetail strip dies	BUDT15-06250		DTI 1601	1/2	3 7/8		6.250	dovetail gripping size>	5.625	5.750	5.875	6.000	6.125	**6.250**	6.375
			5 1/2" casing																
12a	1	set of 2 pcs	tong jaw	5 1/2" tong jaw set w/ 1/2" dovetail strip dies	CJDT76-05500	73014-05500	DTI 1602	1/2	5		5.500	dovetail gripping size>	4.875	5.000	5.125	5.250	5.375	**5.500**	5.625
12b	3	each	backup die f/ tubular	15 x 5 1/2 splined adapter w/ 1/2" dovetail strip dies	BUDT15-05500		DTI 1601	1/2	3 7/8		5.500	dovetail gripping size>	4.875	5.000	5.125	5.250	5.375	**5.500**	5.625
12c	3	each	backup die f/ 6.050" OD API coupling	6.050" die for 15" adapter w/ 1/2" dovetail strip dies	BUDT15-06050		DTI 1601	1/2	3 7/8		6.050	dovetail gripping size>	5.425	5.550	5.675	5.800	5.925	**6.050**	6.175

JAWS & ADAPTERS WITH DOVETAIL DIES for CLE14000DP and BUCS15000

Ref Line No	Qty Reqd	Unit	Tubular Product &Tong or Backup Components	Description	CLINCHER® Strip Die Jaw or Adapter Assembly Part Number (Note 2)	DOVETAIL Jaw Part Number	CLINCHER® DOVETAIL or Wraparound Die Part Number	standard dovetail die thickness required	dovetail die overall length required		nominal jaw & adapter sizes	dovetail die part number for 3 7/8" overall length>	DTI1661	DTI1651	DTI1642	DTI1632	DTI1622	DTI1601	DTI1612
												dovetail die part number for 5" overall length>	DTI1664	DTI1693	DTI1646	DTI1633	DTI1623	DTI1602	DTI1617
												dovetail die thickness>	13/16	3/4	11/16	5/8	9/16	**1/2**	7/16
											Inserts required for standard tubular diameters shown in bold font. REPLACEMENT DOVETAIL INSERTS for TONG JAWS are 1 1/4" wide x 5" long (4 pcs required per tong jaw set). REPLACEMENT DOVETAIL INSERTS for BACKUP DOVETAIL DIE ADAPTERS are 1 1/4" wide x 3 7/8" long (6 pcs required per backup dovetail die adapter set.)								
			5 1/4" tool joint																
13a	1	set of 2 pcs	tong jaw	5 1/4" tong jaw set w/ 1/2" dovetail strip dies	CJDT76-05250	73014-05250	DTI 1602	1/2	5		5.250	dovetail gripping size>	4.625	4.750	4.875	5.000	5.125	**5.250**	5.375
13b	3	each	backup die adapter	15 x 5 1/4 splined adapter w/ 1/2" dovetail strip dies	BUDT15-05250		DTI 1601	1/2	3 7/8		5.250	dovetail gripping size>	4.625	4.750	4.875	5.000	5.125	**5.250**	5.375
			5" casing																
14a	1	set of 2 pcs	tong jaw	5" tong jaw set w/ 1/2" dovetail strip dies	CJDT76-05000	73014-05000	DTI 1602	1/2	5		5.000	dovetail gripping size>	4.375	4.500	4.625	4.750	4.875	**5.000**	5.125
14b	3	each	backup die f/ tubular	15 x 5 splined adapter w/ 1/2" dovetail strip dies	BUDT15-05000		DTI 1601	1/2	3 7/8		5.000	dovetail gripping size>	4.375	4.500	4.625	4.750	4.875	**5.000**	5.125
14c	3	each	backup die f/ 5.563" OD API coupling	5.563" die for 15" adapter w/ 1/2" dovetail strip dies	BUDT15-05563		DTI 1601	1/2	3 7/8		5.563	dovetail gripping size>	4.938	5.063	5.188	5.313	5.438	**5.563**	5.688
			4 3/4" tool joint																
15a	1	set of 2 pcs	tong jaw	4 3/4" tong jaw set w/ 1/2" dovetail strip dies	CJDT76-04750	73014-04750	DTI 1602	1/2	5		4.750	dovetail gripping size>	4.125	4.250	4.375	4.500	4.625	**4.750**	4.875
15b	3	each	backup die adapter	15 x 4 3/4 splined adapter w/ 1/2" dovetail strip dies	BUDT15-04750		DTI 1601	1/2	3 7/8		4.750	dovetail gripping size>	4.125	4.250	4.375	4.500	4.625	**4.750**	4.875
			4 5/8" tool joint																
16a	1	set of 2 pcs	tong jaw	4 5/8" tong jaw set w/ 1/2" dovetail strip dies	CJDT76-04625	73014-04625	DTI 1602	1/2	5		4.625	dovetail gripping size>	4.000	4.125	4.250	4.375	4.500	**4.625**	4.750
16b	3	each	backup die adapter	15 x 4 5/8 splined adapter w/ 1/2" dovetail strip dies	BUDT15-04625		DTI 1601	1/2	3 7/8		4.625	dovetail gripping size>	4.000	4.125	4.250	4.375	4.500	**4.625**	4.750
			4 1/2" casing																
17a	1	set of 2 pcs	tong jaw	4 1/2" tong jaw set w/ 1/2" dovetail strip dies	CJDT76-04500	73014-04500	DTI 1602	1/2	5		4.500	dovetail gripping size>	3.875	4.000	4.125	4.250	4.375	**4.500**	4.625
17b	3	each	backup die f/ tubular	15 x 4 1/2 splined adapter w/ 1/2" dovetail strip dies	BUDT15-04500		DTI 1601	1/2	3 7/8		4.500	dovetail gripping size>	3.875	4.000	4.125	4.250	4.375	**4.500**	4.625
17c	3	each	backup die f/ 5" OD API coupling	5" die for 15" adapter w/ 1/2" dovetail strip dies	BUDT15-05000		DTI 1601	1/2	3 7/8		5.000	dovetail gripping size>	4.375	4.500	4.625	4.750	4.875	**5.000**	5.125
			Note 1: XXXXX indicates this size has not been designed at this time, but is available upon request.																
			Note 2: Part number shown for jaws and adapters using strip dies is for basic part without dovetail strip dies. Dies must be ordered separately.																
			Note 3: Dovetail die adapters are not available for the backup for applications where backup must grip tubulars larger than 8.25. For applications larger than 8.25, splined wrap around dies are required.																
			These are available with full coverage fine teeth. Fine toothed wraparound dies are intended for use on properly sized tubulars. For undersized tubular applications, special dies may be ordered with two																
			columns coarse teeth. These dies are similar in appearance to dovetail die adapters.																

JAWS & ADAPTERS WITH DOVETAIL DIES for CLE14000DP and BUCS15000

Ref Line No	Qty Reqd	Unit	Tubular Product &Tong or Backup Components	Description	CLINCHER® Strip Die Jaw or Adapter Assembly Part Number (Note 2)	CLINCHER® DOVETAIL or Wraparound Die Part Number	standard dovetail die thickness required	dovetail die overall length required		nominal jaw & adapter sizes	dovetail die part number for 3 7/8" overall length>	DTI1661	DTI1651	DTI1642	DTI1632	DTI1622	DTI1601	DTI1612
											dovetail die part number for 5" overall length>	DTI1664	DTI1693	DTI1646	DTI1633	DTI1623	DTI1602	DTI1617
											dovetail die thickness>	13/16	3/4	11/16	5/8	9/16	**1/2**	7/16
										Inserts required for standard tubular diameters shown in bold font. REPLACEMENT DOVETAIL INSERTS for TONG JAWS are 1 1/4" wide x 3 7/8" long (4 pcs required per tong jaw set). REPLACEMENT DOVETAIL INSERTS for BACKUP DOVETAIL DIE ADAPTERS are 1 1/4" wide x 3 7/8" long (6 pcs required per backup dovetail die adapter set.)							
			14" casing															
1a	1	set of 2 pcs	tong jaw	14" tong jaw set w/ 1/2" dovetail strip dies	CJDT14X14000	DTI 1602	1/2	5		14.000	dovetail gripping size>	13.375	13.500	13.625	13.750	13.875	**14.000**	14.125
1b	3	each	backup die f/ tubular	15 x 14 splined adapter w/ 1/2" dovetail strip dies	BUDT15-14000	DTI 1601	1/2	3 7/8		14.000	dovetail gripping size>	13.375	13.500	13.625	13.750	13.875	**14.000**	14.125
1c	3	each	backup die f/ 15" OD coupling	15" die for 15" adapter	BUC150015000	DTI 1601	1/2	3 7/8		15.000	wrap around die size>	14.375	14.500	14.625	14.750	14.875	**15.000**	15.125
			13 5/8" casing															
2a	1	set of 2 pcs	tong jaw	13 5/8" tong jaw set w/ 1/2" dovetail strip dies	CJDT14X13625	DTI 1602	1/2	5		13.625	dovetail gripping size>	13.000	13.125	13.250	13.375	13.500	**13.625**	13.750
2b	3	each	backup die f/ tubular	15 x 13 5/8 splined adapter w/ 1/2" dovetail strip dies	BUDT15-XXXXX	DTI 1601	1/2	3 7/8		13.625	dovetail gripping size>	13.000	13.125	13.250	13.375	13.500	**13.625**	13.750
2c	3	each	backup die f/ 14 3/8" OD coupling	14 3/8" die for 15" adapter	BUC1500XXXXX	DTI 1601	1/2	3 7/8		14.375	dovetail gripping size>	13.750	13.875	14.000	14.125	14.250	**14.375**	14.500
			13 3/8" casing															
3a	1	set of 2 pcs	tong jaw	13 3/8" tong jaw set w/ 1/2" dovetail strip dies	CJDT14X13375	DTI 1602	1/2	5		13.375	dovetail gripping size>	12.750	12.875	13.000	13.125	13.250	**13.375**	13.500
3b	3	each	backup die f/ tubular	15 x 13 3/8 splined adapter w/ 1/2" dovetail strip dies	BUDT15-13375	DTI 1601	1/2	3 7/8		13.375	dovetail gripping size>	12.750	12.875	13.000	13.125	13.250	**13.375**	13.500
3c	3	each	backup die f/ 14 3/8 " OD coupling	14 3/8" die for 15" adapter	BUC150014375	DTI 1601	1/2	3 7/8		14.375	dovetail gripping size>	13.750	13.875	14.000	14.125	14.250	**14.375**	14.500
			11 7/8" casing															
4a	1	set of 2 pcs	tong jaw	11 7/8" tong jaw set w/ 1/2" dovetail strip dies	CJDT14X11875	DTI 1602	1/2	5		11.875	dovetail gripping size>	11.250	11.375	11.500	11.625	11.750	**11.875**	12.000
4b	3	each	backup die f/ tubular	15 x 11 7/8 splined adapter w/ 1/2" dovetail strip dies	BUDT15-XXXXX	DTI 1601	1/2	3 7/8		11.875	dovetail gripping size>	11.250	11.375	11.500	11.625	11.750	**11.875**	12.000
4c	3	each	backup die f/ 12 3/4" OD coupling	12 3/4" die for 15" adapter	BUC1500XXXXX	DTI 1601	1/2	3 7/8		12.750	dovetail gripping size>	12.125	12.250	12.375	12.500	12.625	**12.750**	12.875
			11 3/4" casing															
5a	1	set of 2 pcs	tong jaw	11 3/4" tong jaw set w/ 1/2" dovetail strip dies	CJDT14X11750	DTI 1602	1/2	5		11.750	dovetail gripping size>	11.125	11.250	11.375	11.500	11.625	**11.750**	11.875
5b	3	each	backup die f/ tubular	15 x 11 3/4 splined adapter w/ 1/2" dovetail strip dies	BUDT15-11750	DTI 1601	1/2	3 7/8		11.750	dovetail gripping size>	11.125	11.250	11.375	11.500	11.625	**11.750**	11.875
5c	3	each	backup die f/ 12 3/4" OD coupling	12 3/4" die for 15" adapter	BUC1500XXXXX	DTI 1601	1/2	3 7/8		12.750	dovetail gripping size>	12.125	12.250	12.375	12.500	12.625	**12.750**	12.875
			10 3/4" casing															
6a	1	set of 2 pcs	tong jaw	10 3/4" tong jaw set w/ 1/2" dovetail strip dies	CJDT14X10750	DTI 1602	1/2	5		10.750	dovetail gripping size>	10.125	10.250	10.375	10.500	10.625	**10.750**	10.875
6b	3	each	backup die f/ tubular	15 x 10 3/4 splined adapter w/ 1/2" dovetail strip dies	BUDT15-10750	DTI 1601	1/2	3 7/8		10.750	dovetail gripping size>	10.125	10.250	10.375	10.500	10.625	**10.750**	10.875
6c	3	each	backup die f/ 11 3/4" OD coupling	11 3/4" die for 15" adapter	BUC1500XXXXX	DTI 1601	1/2	3 7/8		11.750	dovetail gripping size>	11.125	11.250	11.375	11.500	11.625	**11.750**	11.875
			9 7/8" casing															
7a	1	set of 2 pcs	tong jaw	9 7/8" tong jaw set w/ 1/2" dovetail strip dies	CJDT14X09875	DTI 1602	1/2	5		9.875	dovetail gripping size>	9.250	9.375	9.500	9.625	9.750	**9.875**	10.000
7b	3	each	backup die f/ tubular	15 x 9 7/8 splined adapter w/ 1/2" dovetail strip dies	BUDT15-XXXXX	DTI 1601	1/2	3 7/8		9.875	dovetail gripping size>	9.250	9.375	9.500	9.625	9.750	**9.875**	10.000
7c	3	each	backup die f/ 10 5/8" OD coupling	10 5/8" die for 15" adapter	BUC1500XXXXX	DTI 1601	1/2	3 7/8		10.625	dovetail gripping size>	10.000	10.125	10.250	10.375	10.500	**10.625**	10.750
			9 5/8" casing															
8a	1	set of 2 pcs	tong jaw	9 5/8" tong jaw set w/ 1/2" dovetail strip dies	CJDT14X09625	DTI 1602	1/2	5		9.625	dovetail gripping size>	9.000	9.125	9.250	9.375	9.500	**9.625**	9.750
8b	3	each	backup die f/ tubular	15 x 9 5/8 splined adapter w/ 1/2" dovetail strip dies	BUDT15-09625	DTI 1601	1/2	3 7/8		9.625	dovetail gripping size>	9.000	9.125	9.250	9.375	9.500	**9.625**	9.750
8c	3	each	backup die f/ 10 5/8" OD coupling	10 5/8" die for 15" adapter	BUC1500XXXXX	DTI 1601	1/2	3 7/8		10.625	dovetail gripping size>	10.000	10.125	10.250	10.375	10.500	**10.625**	10.750

Note 1: XXXXX indicates this size has not been designed at this time, but is available upon request.

Note 2: Part number shown for jaws and adapters using strip dies is for basic part without dovetail strip dies. Dies must be ordered separately.

Splined jaws, splined die adapters and splined wraparound dies for CLINCHER® 8 5/8 Drillpipe Tong and 8 5/8 LOCKJAW™ Backup for Drillpipe for use on tubing and casing

Nominal wraparound tong jaw and wraparound adapter size	Splined Jaw Assembly Number *assembly consists of two jaws c/w pins, rollers, clips and clip bolts*	splined jaw part number *two pcs reqd per set*	splined jaw roller part number *two pcs reqd per set*	splined jaw pin part number *two pcs reqd per set*	top clip part number for tong jaws *eight pcs reqd per set*	bottom clip part number for tong jaws *eight pcs reqd per set*	available wraparound die series (two dies are required to dress tong jaws and three dies are required to dress backup for a total of five dies per tool - excludes any dies required for couplings)		
							fine tooth steel dies for tong	**GRIT FACE™** dies for tong	non-marking aluminum dies for tong
7 5/8 x 7 5/8 - 5 1/2	CJ-76C	76062	73012-01	73013-01	73064	73064	BUC7625-nnnnn	BB7625-nnnnn	BUCA7625-nnnnn
8 5/8 x 8 5/8 - 5 1/2	CJ-86A	86062	86012	86013	73064	73064	BUC8625-nnnnn	BB8625-nnnnn	BUCA8625-nnnnn
7 5/8 x 5 1/2 - 4 1/2 **(Note 1)**	CJ-LF-76D	73063	73012 w/ Bushing 72025 & BUCS4027	73013	73064	73064	BUC7625-nnnnn	BB7625-nnnnn	BUCA7625-nnnnn
8 5/8 x 8 5/8 - 5 1/2	CJ-LF-86B	86092	73012 w/ Bushing 72025 & BUCS4027	73013	73064	73064	BUC8625-nnnnn	BB8625-nnnnn	BUCA8625-nnnnn
		Die Adapter					fine tooth steel dies for backup	grit faced dies for backup	non-marking aluminum dies for backup
8 5/8 x 8 5/8 - 5 1/2	N/A	BUCA86-05500	N/A	N/A	73064	73064	BUC8625-nnnnn	BB8625-nnnnn	BUCA8625-nnnnn

-nnnnn indicates size by be designated by replacing "nnnnn" sequence with size required (in inches) to three decimal places; i.e., 4.500 for 4 1/2" OD casing.

Note 1: Not recommended for use with tubulars smaller than 4 1/2.

Note 2: **CLINCHER®** wraparound dies are machined to specific casing, tubing, coupling or accessory diameter. Additional dies must be orderd to match specific coupling diameters associated with accessories or special clearance premium tubular connections.

ASSEMBLY INSTRUCTIONS

FASTENER LUBRICATION AND MAKE UP TORQUE REQUIREMENTS

Most bolts, nuts, and other threaded components are to be lubricated with Never-Seez or equivalent before assembly. Certain fasteners are to be assembled using permanent or removable Loctite as indicated in the assembly instructions. All tapered pipe threads are to be treated with a Teflon based pipe dope to assist in makeup and prevent leakage.

CAUTION: Do not use teflon tape. Improper application of teflon tape can cause joint failures. Teflon tape can release large particles which can plug small passages in hydraulic equipment.

All standard fasteners used in **CLINCHER®** products are to be GRADE 8 or better. DO NOT SUBSTITUTE lesser grades of fasteners. All fasteners are to be made up to the torque charted below. Failure to properly assemble these fasteners can result in their loss, product malfunction, and ultimately result in situations where personnel can be exposed to dangerous situations.

TONG and BACKUP FASTENERS		
Size	***Application***	***Torque***
1/4 - 20 NC	door switch mounting bolts	10 ft lbs
3/8 - 16 Set Screws	bearing caps, door switch adj. sleeve	* [1]
3/8 - 16 NC	locking pin retainer bolt, door latch pivot pin bolt, clip bolts, jaw bolts	33 ft lbs
1/2 - 13 NC	brake bands, motor mounts, upper bearing caps, idler race, door bolt	93 ft lbs
5/8 - 11 NC	top and bottom tong plates, lower bearing caps, hanger bolts	180 ft lbs
3/4 - 10 NC	jaw adapter bolts, backup bolts	317 ft lbs
7/8 - 14 NF	cam follower	512 ft lbs
1 - 8	cage plate spacer bolts, backup door bolts, bail bolts	100 ft lbs
1 - 12 NF	dumbell roller, tong door jam nut	* [2]
1 1/2 - 12 NF	idler shaft	1,200 ft lbs
1 3/4 - 5 NC	short idler shaft	2,200 ft lbs

* 1 Bearing Caps: Coat with removable Loctite, tighten until screw contacts bearing, back off 1 turn.
* [2] Tighten until all slack is removed, but dumbell roller is still free to rotate by hand.

ASSEMBLY INSTRUCTIONS

LUBRICATION STANDARDS

Bearings and gears must be lubricated to minimize friction, cool, exclude foreign matter, and prevent corrosion. **CLINCHER®** recommends using Texaco Marfak MP 2 or equivalent for all grease zerts, roller bearings and bushings. Gears located within the clutch housing or between the tong plates are to be heavily lubricated using PLUSCO 855 or equivalent.

OPERATION

Suspension

A) Assure that the tong is suspended in level manner. Both tong and backup must be level at the point they contact the tubular. Using adjustment screws and slots in rigid hanger assembly, adjust tong so that it hangs level on horizontal axis and is parallel to tubular on vertical axis. If using 3 point bridle, use turnbuckles to adjust tong so it hangs level. Positioner leveling jacks and tong suspension cables.

B) Make certain that floor space is adequate to maneuver tong on and off pipe. The space must be clear of obstructions to allow safe and unrestricted operation.

Jaw and Wrap Around Die Installation

A) Be sure all power to unit is off, and power unit is shut down. Disconnect hydraulic hoses.

B) Determine O.D. of tubular to be made-up or broken-out. Use proper dies to bite O.D. of tubular and insert as follows: Remove jaw assembly from tong. Remove upper die retainer clips. Insert die into jaw. Reinstall clips and clip retainer bolts. Reinstall jaws into cage plates, install pivot pins and reattach springs.

Hydraulic Lines

A) Be sure all power to unit is off, and power unit is shut down.

B) Always inspect hoses prior to installation for abrasions, kinks, and other visible damage.

C) Install hydraulic supply hose and hydraulic return hose between tong and hydraulic power unit. Be advised that the standard installation on **CLINCHER®** Tong calls for 1" Hydraulic Supply hose and 1-1/4" Hydraulic Return hose. The differing hoses eliminates the possibility of attaching the wrong hose to the wrong outlet while at the same time reducing back pressure in your hydraulic system.

OPERATION

Tong Operation

A. Insure proper dies are installed. Connect hydraulic hoses, verify reservoir is full of hydraulic fluid and insure suction valve is open.

B. Open bypass valve to hydraulic system, then check to make sure all hose connections are secure and hydraulic system is free of leaks.

C. Be certain door is completely closed before operation to insure safe operation. The **CLINCHER®** CLE14000DP is equipped with a door switch, which prevents operation of the tong when door is even partially open.

D. Use power unit to start up procedure as outlined in your owners manual supplied by the manufacturer.

E. In the event hoses are not tightened securely, possible failures to hydraulic system can occur.

   1) If pressure supply hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit, resulting in increased RPM in the power unit.

   2) If return line hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit and the hydraulic system to the tong itself, resulting in the tong motor increasing to maximum pressure and possible motor seal failure.

F. After completion of A through E restart the power unit and allow engine to idle for approximately 10 minutes. Slowly close bypass valve to allow circulation of hydraulic oil through tong and hoses. Place shifting lever into low and rotate several times. Repeat in reverse. If correct jaw-die combination is installed, the unit is now ready to run pipe.

G. Adjust height of tong and backup to proper height, using the control valve located all the way to the right of rear valve bank assembly.

H. Stand in the normal operators position, insert the locking pin into the rear cage plate hole (on operators side). This pin allows ring gear to rotate clockwise (make-up) and engage the can to close jaws on pipe.

I. Swing tong and backup onto tubing, making sure to align tubing on rear jaw of backup. Close backup jaws by pushing middle control lever forward. The design of the **CLINCHER® LOCKJAW™** Backup centers pipe in the backup and tong. Close tong door.

J. Rotate ring gear clockwise by pushing motor control lever on the front valve bank assembly forward until jaws lock on pipe and continue to rotate until desired amount or torque is applied.

K. After correct amount of torque specific to that connection has been applied, release tong jaws by pulling back on motor control lever until jaws release and throat in cage plate is aligned with door opening. Open door.

L. Release backup by pulling back on right control lever on rear valve bank assembly until backup jaws are completely retracted.

M. High and low gear is adjusted by use of shifting lever PN 45060, located to the left side of the shifting housing. With the lever in the upwards position the tong is in high gear. With the shifting lever in the downward position, the tong is in low gear.

INITIAL SETUP GUIDELINES

Refer to Control Panel Illustrations in Section 12.

1. Establish equipment layout. Setup tong positioner so tong extends to center of well bore or mouse hole as required.

2. Insure tong positioner base is level in all directions using leveling jacks or other means.

3. Remove shipping stiffer bars from front of positioner to release tong and backup.

4. Rigidly fix tong positioner to deck magnets or other appropriate means to prevent inadvertent movement or misalignment.

5. Position hydraulic hoses and control console as required to avoid exposing personnel to hazards.

6. Fully extend power unit hydraulic hoses.

7. Connect power unit's 1" pressure (a.k.a. supply), 1 1/4" tank (a.k.a. return) and hoses to appropriate quick disconnects located on back of tong positioner control console. Double check to insure all quick disconnects are connected to their mating coupler and that they are fully seated. Note threaded, wing type quick disconnects are marked with a proper makeup line.

8. In the event hoses are not tightened securely, possible failures to hydraulic system can occur. If pressure supply hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit, resulting in increased load and speed in the power unit.

9. Do not reduce size of return hose, quick disconnects or fittings. If return line hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit and the hydraulic system in the tong itself, resulting in the tong motor case pressure increasing to maximum pressure and possible motor seal failure.

10. Organize hose bundles and position or guard so they are not trip hazards. Protect hoses so they will not become damaged by moving equipment.

START UP INSTRUCTIONS

1. Insure tong and backup are rotated to vertical pipe position. If they are in horizontal pipe position, energize power unit and rotate to vertical pipe position using procedures listed below and in Operating Instructions - Tong and Backup Positioner Rotating Procedure.

   <u>WARNING</u>: ALWAYS SHUTDOWN POWER UNIT and DISCONNECT SUPPLY HOSE from POWER UNIT BEFORE WORKING ON ANY PORTION OF THE SYSTEM INCLUDING CHANGING OR CHECKING JAWS OR ADAPTERS.

2. Determine diameter of tubular, tooljoint or BHA to be made-up or broken-out.

3. Refer to tong jaw and backup adapter selection chart in Section 3 to determine the appropriate jaws, adapters and dovetail strip die inserts required for this diameter. **CAUTION:** Do not attempt to use jaws or adapters outside of specified ranges. Attempting to grip oversized or undersized tubulars can result in damage to equipment and tubulars.

4. Check tong jaw to insure jaw, pin and roller are not damaged, and that they are free of rust and debris. All components must be well lubricated with grease containing a corrosion inhibitor. Insure jaw rollers turn freely on jaw pins. Replace worn or damaged dovetail strip die inserts. Insure die retainers are properly tightened. For tubulars requiring wrap around dies, select the proper jaw assembly and its corresponding wrap around die. Remove upper die retainer clips. Insert die into jaw. Reinstall clips and clip retainer bolts.

5. Check tong jaw pocket to insure it is not damaged, and that it is free of rust or debris. Thoroughly lubricate tong jaw pockets with grease containing a corrosion inhibitor.

6. Install tong jaws in tong jaw pockets. Attach all jaw retraction springs.

7. Clean splines on backup jaws to insure they are not damaged and free of rust or debris. Lubricate splines with grease containing a corrosion inhibitor.

8. Check dovetail die adapter to insure they are not damaged, and that they are free of rust and debris. Replace worn or damaged dovetail strip die inserts. Insure die retainer bolts and die adapter clip bolts are properly installed and fasteners tightened. For tubulars requiring wrap around dies, select the proper adapter and its corresponding wrap around die. Remove upper die retainer clips. Insert die into adapter. Install into backup and reinstall clips and clip retainer bolts.

   Note: The backup uses a circular key to insure axial pipe loads do not damage adapter retainer clips. Refer to backup assembly drawings in Section 10 for cylinder, inside and outside doors. To remove an adapter you must first remove the circular key retainer set screw and then remove the circular key. Due to its recessed nature, it may be necessary to use a small diameter punch or similar device to tap the circular key from its position behind the adapter. To reinstall, use the reverse procedure installing the retainer set screw after the circular key is in place.

START UP INSTRUCTIONS

9. Verify tong suspension systems for vertical and horizontal operation are free to move in both directions to accommodate thread lead in makeup and breakout operations.
   CAUTION: Failure to accommodate for lead will damage tong, backup or connection. If extremely long connections must be made up or broken out, the operator will have to release and reset the tong jaws periodically to allow the suspension system springs to relax to provide more stroke.

10. Lubricate entire system by injecting grease into zerts located on positioner, tong and backup.

11. Drain condensed water from air dryer and check/add oil to air lubricator air filter/regulator/ lubricator assembly.

12. If required, set up torque turn data acquisition and control computer, connect dump valve solenoid, electronic load cell and electronic turns encoder.

13. RECONNECT POWER UNIT SUPPLY HOSE TO TONG CONTROL CONSOLE.

DIESEL DRIVEN HYDRAULIC POWER UNIT STARTUP

1. Inspect all hoses for abrasions, kinks or other visible damage.

2. Check engine oil level, diesel fuel level and hydraulic oil level. Top up as required.

3. Check to verify hydraulic oil suction isolation valve is OPEN. Caution operating power unit with the suction isolation in closed position will destroy hydraulic pump.

4. Open fuel shutoff valve. Open and reset air intake and fuel shutdowns as required.

5. Connect air supply hose to tong control panel.

6. Connect starter air hose to engine starter and start engine. Bleed starter air hose, disconnect and stow as required.

7. Allow engine and hydraulic oil to warm up ten (10) minutes before actuating any components.

8. Check all hoses and connections for hydraulic leaks.

   CAUTION: This system is designed to exclusively utilize closed center valves and a pressure compensated hydraulic pump with load sense feature. **WARNING: Attempting to operate this unit with a power unit designed for open center valves will result in the power unit operating continuously at maximum pressure, will cause overheating and may cause equipment failures exposing personnel to high pressure, high temperature hydraulic fluid leaks which can result in fatalities.**

9. Using Tong Control Console actuate all positioner, tong and backup controls to test all functions while checking for leaks.

   Note: The **CLINCHER®** tong is equipped with a door position sensor which will prevent rotation of the tong if the door is open. A cage plate position sensor will prevent actuation of the Reversing Pin cylinders unless the cage plates are precisely positioned in the open throat condition. Note a vertical position sensor switch will prevent tong positioner rotation from horizontal to vertical position except when positioner is in maximum elevation condition. A separate rotational position sensor will prevent vertical tong positioner movement unless the tong is fully rotated to the vertical or horizontal positions.

OPERATING INSTRUCTIONS

1. Determine if tong is to be used with horizontal pipe in rack or vertical pipe in false rotary. Rotate to other position if required.

2. Confirm proper jaws and adapters are installed.

TONG AND BACKUP POSITIONER ROTATING PROCEDURE

1. Using tong directional control valve slowly rotate tong ring gear and cage plates to open throat position using rotation opposite of the rotation last used. This valve is spring loaded and will return to neutral position when it is released.. Ring gear and cage plate should automatically stop at open throat position and jaws should be fully open. NOTE: Rotating at high rate of speed will overshoot open throat position. Verify cage plate and ring gear are in open throat position.

2. Open tong door by shifting tong door directional control valve to the "OPEN" position.

3. Open backup shifting backup directional control valve to "OPEN" position. This valve is spring loaded and will return to neutral position when it is released.

4. Move tong positioner laterally to rear of structure (away from pipe) by shift positioner traverse directional control valve to the "OUT" position until the positioner clears all pipe in rack or false rotary. This valve is spring loaded and will return to neutral position when it is released.

5. Raise tong positioner to its uppermost position by shifting positioner elevation directional control valve to the up position until the unit stops moving. This valve is spring loaded and will return to neutral position when it is released.

6. Slowly rotate tong positioner to required state by shifting tong positioner rotation directional control valve as required. Continue rotating until movement stops. This valve is spring loaded and will return to neutral position when it is released.

7. Lower unit to lowermost position and shift in to operating position as needed using reverse procedures.

OPERATING INSTRUCTIONS

SETTING TONG OPERATION

Note: These operations may only be performed when the ring gear and cage plates are in the open throat position.

1. Set tong operation by shifting mode directional control valve to "Make" for make-up or "Break" for break-out. Note: This valve is detented and will remain in desired position until shifted.

2. Shift reversing pin to correspond to "Makeup" or "Breakout" as indicated by raising spring loaded safety guard and momentarily shifting the valve corresponding to the operation required. Note: These valves are spring loaded and will return to neutral position when released causing cylinder to retract. This action will cause one of the reversing pin control cylinders to momentarily extend to toggle the reversing pin into the correct location. **Caution: Do not extend both cylinders simultaneously as equipment damage may result**. Release the valve to allow it to return to the "NORMAL" position and release the safety guard. Note when switching the BREAKOUT operations use alternate valve.

3. For horizontal makeup load tubulars on to rack and feed first joint to second rack. Position coupling at location between the tong and backup.

4. Insure backup doors and tong door are open. Verify tong ring gear and cage plates are in the open throat position. Confirm tong jaws are fully retracted.

5. Check and adjust tong and backup's vertical height until tong and backup centerline is at same elevation at tubular's centerline. NOTE: Vertical position adjustments will be required whenever tubular diameters are changed.

6. Slowly move tong positioner in towards pipe until centerline of tong jaws is aligned with centerline of tubular.

7. Close backup on pipe by pushing panel mounted backup directional control valve. Note: System Hydraulic Pressure as shown on panel mounted gauge should rise to 2500 psi when backup is fully set. Release control valve handle and allow it to return to neutral position.

8. Close tong door by shifting directional control valve to closed position. Note: Valve is de-tented and will remain in closed position until opened.

9. Slowly feed pin thread of second joint into box thread of first joint.

10. Select gear ratio required by shifting tong gear directional control valve. Note: Valve is detented and will remain in set position until shifted. **CAUTION:** Do not shift tong gears while the tong is rotating.

OPERATING INSTRUCTIONS

11. Select motor speed required by rotating motor speed directional control valve. Note: Valve is detented and will remain in set position until shifted. Note: Motor speed may be changed while motor and tong are rotating.

12. Note: For non-critical applications, the makeup torque maybe hydraulically limited using the torque limiter valve. To use this feature, back out (by rotating counter-clockwise) panel mounted torque limiter until it stops.

13. Slowly close tong jaws on pipe by shifting tong motor directional control valve until pipe starts rotating. Note this valve has proportional response and can be used to meter or precisely control the speed of the tong by limiting the amount of hydraulic oil delivered to the motor. If required, the tong's air cylinders can be used to assist stabbing and starting thread makeup by rotating the air cylinder control valve from the ***breakout*** position to the ***normal*** position AFTER the tong jaws have been closed on the tubular.

14. Verify backup pressure is still at 2500 psi as read on gauge by momentarily pushing backup control valve to closed position.

15. Continue to rotate the tong until pressure required to rotate matches setting of torque limiter. Slowly tighten torque limiter valve until the desired torque is read on the torque gauge or the torque data acquisition and control system dumps the hydraulic pressure. Note: Tong must be able to move downward to accommodate thread lead during makeup or upward during breakout. Check torques readings and torque limiter valve setting frequently to insure no other adjustment is required.

16. Note: In critical torque applications the torque gage should not be used to measure and control applied torque. A torque turn data acquisition and control system with automatic dump feature must be used for precise control to avoid leaks or damaged connections.

    Note: It may be necessary to shift from high to low gear during some make-up operations to achieve required torque.

OPERATING INSTRUCTIONS

RELEASING TONG AND BACKUP FROM PIPE

1. Using tong directional control valve slowly rotate tong ring gear and cage plates to open throat position using rotation opposite of the rotation last used. Ring gear and cage plate should automatically stop at open throat position and jaws should be fully open. NOTE: Rotating at high rate of speed will overshoot open throat position.

2. Verify cage plate and ring gear are in open throat position. Note: Tong may move up or down when jaws release depending upon operation performed.

3. Open tong door by shifting tong door directional control valve to the "OPEN" position.

4/ Open backup shifting backup directional control valve to "OPEN" position. Move tong positioner laterally to rear of structure (away from pipe) by shift positioner traverse directional control valve to the "OUT" position until the positioner clears all pipe in rack or false rotary.

5. Feed made-up stand of tubulars out of rack and feed in next joints for makeup.

MAINTENANCE

CLINCHER® recommends that owners of **CLINCHER®** Hydraulic Power Tongs, Backups, **CHROMEMASTER™**s, and accessories adapt a regularly scheduled maintenance program. Implementation of this type of program offers several benefits. First you increase the life of your equipment, secondly, you may find a problem before it escalates to a costly repair or down time on the job, and most important, prevent injury to operating personnel.

A major inspection (described at the end of this section) should be carried out if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out.

Routine Maintenance

Cleaning - Upon return from each and every job:

A) Pre-wash unit to remove majority of dirt and grease build up as to allow removal of dies, and inspection of overall condition of unit.

B) Remove and inspect dies from tong and backup. Note any missing or damaged die retainers, and/or die retainer bolts.

C) Remove side jaws from tong and inspect side jaw for missing or broken parts, damaged splines, broken ears (locking hooks on front portion of side jaws).

D) Clean and inspect side jaws, jaw pins, jaw rollers for damage or excessive wear. Lubricate pins and rollers, and reinstall in tong.

E) Remove, clean (in non-flammable solvent), and inspect back jaws in tong.

F) Check jaw pins for breakage, cracks, and uneven wear patterns. Inspect jaw rollers for cracks, breakage, and flat spots.

G) Reassemble jaw sections replacing any damaged parts. Lubricate jaw pins and rollers using gear grease. Set aside for testing.

H) Clean and inspect backup operating cylinder. Insure spline area is free from damage and any rust or dirt is removed. Replace any missing or damaged die retainer clips and die retainer bolts.

I) Inspect hanger and all hoses for wear, replace as necessary.

J) Inspect hanger assembly to assure all parts are returned and in operating condition. (*i.e.* H-Plates, spring, leg springs, leg spring caps and pins)

K) Replace jaw pins and rollers in tong.

L) Lubricate tong=s cam followers (upper and lower), dumbell roller shafts (upper and lower zerts), door shaft, center idler gear shaft, outboard idler gear shafts (2), pinion gear and secondary gear assemblies (Pinion gear and secondary gear assemblies are installed with sealed bearings. There are no provisions to grease these bearings. However, if replaced by non-sealed bearings, the 1/8" NPT flush plugs should be replaced with zerts PN 1001 and both gear assemblies should be added to the regular lubrication schedule.), low gear housing, and shift housing (2 zerts each), and re-pack tong body cavity. Lubricate zerts in backup plates and pins.

MAINTENANCE

M) Install dies of a size needed for testing purposes, and attach hydraulic power unit to tong. Before energizing power unit make certain no one is working on tong or backup and all tools and parts are removed from the tong and backup.

N) Insert test mandrel of the exact same size as the dies which are installed in the tong and backup.

Caution: Testing the function of the backup without the proper size dies installed and/or without the proper size mandrel in place, you risk serious damage to the backup cylinder.

O) After power unit has reached operating RPM and temperature, operate the backup control valve and close backup around test mandrel using sufficient flow and pressure to clamp mandrel and maintain pressure to backup. (Recommended operating pressure of 2,500 psi.) Backup pressure gauge should match system operating pressure. After release of control valve you may experience a slight drop in backup pressure (up to 300 psi), this is normal. If backup pressure drops more than 300 psi within 2 minutes, you may be experiencing a hydraulic leak.

P) While maintaining pressure on backup visually inspect hoses, stainless steel lines, fittings, etc., for seepage of hydraulic fluid. Repair or replace parts causing leaks. If you see no visible external leaks and your backup is still losing pressure, there may be an internal leak in the operating cylinder or load holding valve allowing fluid to bypass the piston. It is recommended that the backup be returned to the manufacturer for repair.

Q) If at this time your backup is functioning correctly, open and close unit several times to insure consistent operation.

R) With the proper dies installed in the tong and backup, and test mandrel locked in the backup, place reversing pin into the make-up position, set tong into low gear and operate tong through several cycles of locking, biting, and torqueing to required torque. Change reversing pin to break-out position and repeat. Repeat same procedure in high gear.

Note: Torque developed in high gear is considerably less than torque developed in low gear.

S) Test door interlock system by opening door slightly with tong rotating. (Remove test mandrel for this procedure.) The tongs rotation should stop. If tong rotation fails to stop, close door, cease rotation, deactivate power unit, and inspect door interlock switch for damage. Insure that adjustment collar is oriented to allow wheel of door switch to fit into recess on collar.

Warning: If door switch system is not functioning properly tong must not be used.

T) Reinspect tong and backup hydraulic system for leaks.

U) If at this time the unit is functioning as intended, replace all covers and grease splines in tong and backup (side jaws and back jaws), tape or grease spools on control valves (to prevent paint from adhering to polished spool surface), prime and paint unit for storage.

MAINTENANCE

Recommended Lubrication Schedule Performed after Completion of Each Job

Hydraulic Tong

A) Cam followers: upper and lower (all)
B) Dumbell roller shafts: upper and lower (all)
C) Door shaft
D) Center idler shaft
E) Outboard idler shaft (4)
F) Low gear housing (2 zerts)
G) Shift housing (2 zerts)
H) Re-pack tong cavity
I) Pinion and secondary gear shafts (if sealed bearings have been replaced by non-sealed bearings)
J) Jaw rollers and pins. Remove jaw pins and rollers, clean and lubricate with gear grease.
K) Inspect hydraulic fluid for foreign material and contaminants. Filter or replace. You must filter or replace entire system including power unit tank and lines along with tong to insure all contaminants are removed.

Annual Major Maintenance

Inspection and Repair

Routine preventative maintenance will significantly extend the operating life of your equipment, reduce operating cost and avoid downtime. **CLINCHER®** recommends a program of frequent routine inspection and if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out, perform the following:

A) Visually inspect components on power tongs and backups, which could possibly have been damaged either during operation or transit. *i.e.* Damage to hanger assembly, hydraulic backup, mounting legs, or hydraulic valve assembly.

B) Check test date. Ensure that a load test and inspection was carried out within the last 9 months.

C) Check ring gear. Check for any signs of damage or wear.

D) Remove motor and valve assembly from the tong body.

E) Check motor seal. Apply power, run the motor and visually check the motor seal for any signs of leakage.

F) Check drive gear, high and low pinion gears. Check for excessive sign of wear on the motor gear.

MAINTENANCE

G) Check condition of control valve spools. Activate valves and check for any sign of wear, pitting or scoring of the chrome surface of the spools. If the spool is damaged in any way, the complete section must be changed out as spools are not interchangeable.

H) Check gear selector and shaft. Visually inspect the shifting shaft for alignment and straightness.

I) Check Hi/Low Gear assembly. Visually inspect high and low clutch and gears for any sign of chipped, broken, or worn teeth.

J) Check dumbell rollers, shafts and bushings. Check for excess movement on either bearings, bushings, shafts, or dumbells.

K) Check idler gears and center pinion shaft gears and bearings. Check that there are no signs or worn, chipped, or broken teeth on the idler and center pinion shaft gears.

L) Check door bearings. Visually check excess movement on bearings at the door assembly. If excess movement is found the door must be removed making careful note of bearing washers positions for reassembly.

M) Check door switch system. Visually check that the door switch valve has sufficient strength to hold door in closed position. If this is not the case, then repairs are required.

N) Check door safety device. Functionally check the tong door safety switch. Engage low gear, open tong door and push rotor control lever forward as if to rotate rotor. If safety device is operational then the rotor will not rotate.

O) Check lifting hanger and test date. Check lifting hanger for damage. Ensure that a load test and inspection was carried out within the last 9 months.

P) Check condition of all hydraulic hoses and fittings. Visually inspect all hydraulic hoses fitted to the tong and in the backup for any signs of leaks, cuts, or wear.

Q) Reinstall all parts which were removed for inspection and/or damage. Connect to hydraulic power supply and function test operation of tong in high, low, forward, and reverse. Torque test utilizing appropriate dies and test mandrel. Test operation of lift cylinder.

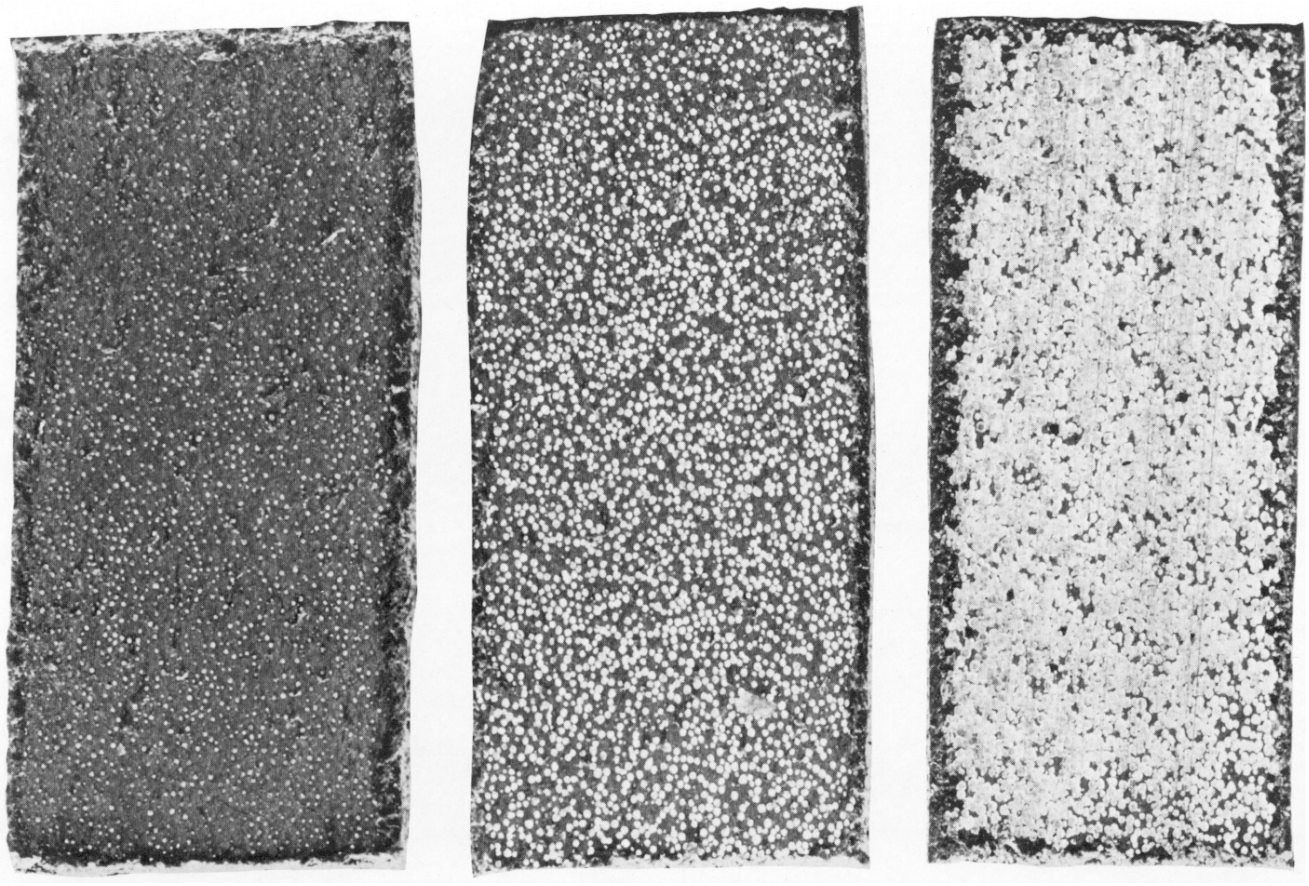
R) Inspect power unit system according to manufactures specifications.

S) Lubricate tong and backup according to maintenance schedule preceding this section.

T) Paint, remembering to mask off surfaces not intending to paint with grease or masking tape.

U) Complete dated inspection report giving details of all duties performed along with complete list of items replaced.

DU® BEARING DRY WEAR PROCESS



1. 2. 3.

1. Running-in completed. Low wear rate starts when up to 10% of the bronze is exposed.

2. Typical surface appearance when DU® bearing approaches its half life with 40% to 50% of the bronze exposed.

3. Bronze is beginning to smear near the end of DU's useful life as a dry bearing. Over 75% of the bronze is visible at the surface.

For additional information about DU bearings, please contact Garlock Bearings Inc,
700 Mid Atlantic Parkway, Thorofare, New Jersey 08086. **(609) 848-3200** FAX: (609) 848-5115

TROUBLE SHOOTING

HYDRAULIC SYSTEM

Hydraulic Pump Making Excessive Noise:

	Problem	Solution
A)	Restricted or clogged intake line	Clean line, check for contamination.
B)	Contaminated fluid	Flush system, change fluid.
C)	Restricted vent	Clean or replace air vent.
D)	Air in fluid	Check for leaks and be certain fluid suction in tank is well below hydraulic fluid in reservoir.
E)	Damaged or worn parts	Repair or replace damaged parts, check fluid for contamination.
F)	Excessive RPM	Check PTO, gears and recommended speed to assure proper pump is installed for operation.
G)	Increased friction	Make sure pump has been assembled using correct torque values.
H)	Damaged or worn relief valve.	Replace relief valve.
I)	Damaged or worn check valve.	Replace check valve.
J)	Restricted discharge	Check to make sure relief valve is set to proper pressure.
K)	Valve system restricted	Inspect and repair or replace defective parts, check system for contamination.

TROUBLE SHOOTING

Excessive Wear to Hydraulic Components:

	Problem	Solution
A)	Fluid contamination	Flush fluid system, replace with new fluid.
B)	Components misaligned	Inspect and realign.
C)	High operating pressures	Gauge and set to proper pressure.
D)	Exhausted fluid (depletion of additives)	Flush fluid system, replace with new fluid.
E)	Air in fluid	Check for leaks, and be certain fluid suction in tank is well below hydraulic fluid in reservoir.
F)	Shortened bearing life	Check alignment, insure proper lubrication to non-sealed bearings.

HYDRAULIC TONG SECTION

Slow Tong Speed:

	Problem	Solution
A)	Restricted supply line	Clear supply line and check intake on reservoir.
B)	Low fluid level	Add fluid to proper volume.
C)	Air leak	Locate and repair leak.
D)	Pump speed insufficient	Assure proper pump speed for application.
E)	Damaged or worn equipment	Isolate pump and check pressure to determine whether motor or pump is defective. Repair or replace defective part.
F)	Pump not primed	Check fluid viscosity and restrictions of intake line. Replace fluid if inadequate for operating temperature.
G)	Low or no flow from supply line	Check to assure couplings are securely fastened.
H)	Hydraulic bypass valve malfunction	Inspect. Adjust unloading pressure. Replace or repair as necessary.

TROUBLE SHOOTING

Insufficient Torque:

	Problem	Solution
A)	Door switch malfunctioning	Check to make sure door is completely closed. Inspect door switch and dump valve. Replace or repair door switch and/or dump valve.
B)	Relief valve malfunctioning	Relief set too low, broken valve spring, contamination or defective seals.
C)	Damaged or worn pump parts	Inspect, repair or replace.
D)	Slow pump speed	Assure proper pump speed for application.
E)	Improper system fluid	Check fluid viscosity and replace fluid if inadequate for operating temperature.
F)	Directional control valve set improperly	Check relief and directional control valve. Neutral should return slightly to reservoir.

Hydraulic Tongs System:

	Problem	Solution
A)	Damage to motor	Inspect, repair or replace.
B)	Restriction of supply line, excessive back pressure	Check to assure couplings are securely fastened.
C)	Defective gauge or load cell	Inspect, repair or replace. Assure unit has been calibrated to proper arm length. NOTE: When using **CLINCHER®** integral backup system, it is the length of backup arm, NOT the tong arm length.

TROUBLE SHOOTING

Difficulty Shifting Gears:

	Problem	Solution
A)	Broken key in shifting yoke	Inspect and replace key stock in shifting yoke.
B)	Worn or damaged shifting yoke pins	Inspect and replace broken or worn pins.
C)	Insufficient lubrication	Pump grease into both zerts located on shift housing.
D)	Detent ball bearing set too tight spring	Inspect and relieve pressure by adjust-ing set screw on drive gear PN 55084.

Failure to Grip Tubulars:

	Problem	Solution
A)	Jaws move out from neutral, but fail to penetrate pipe.Tong not perpendicular.	Inspect die size and replace with correct dies for pipe. Wrong size dies for tubulars. Assure suspension of tong is perpendicular to tubulars. Adjust hanger as necessary.
B)	Jaws fail to move out of neutral. Brake band not tight enough, faulty cam followers, rust debris or damage to jaws.	Inspect for excessive wear on brake band. Inspect and replace defective cam followers. Remove rust and debris from jaws, and jaw pockets. Inspect jaw rollers and pins for wear, flats and lubrication. Repair, replace, and lubricate as needed.
C)	Tong will not release from tubular. Brake band not tight enough, defective cam followers in cage plate, insufficient lubrication to jaw pin and roller.	Inspect for excessive wear on brake band. Inspect and replace defective cam followers. Remove rust and debris from jaws, and jaw pockets. Inspect jaw rollers and pins for lubrication. Repair, replace, and lubri-cate as needed.
D)	Tong motor runs but ring gear does not rotate. Broken gears or defective shift in Hydraulic Tongs System.	Inspect and replace defective gears. Inspect and repair or replace defective shifting parts.
E)	Tong binds under light load. Worn or damaged cam followers, dumbell roller bearing or idler bearing.	Inspect and replace defective parts.
F)	Ring gear rotates while control lever is in neutral	Replace control valve.

TROUBLE SHOOTING

G)	Shift will not stay in set position. Lost detent ball or spring.	Replace detent ball and spring.
H)	Hydraulic fluid leaking from motor. Damaged or worn motor shaft seal.	Replace motor shaft seal.

HYDRAULIC BACKUP SYSTEM

Backup Fails to Grip Tubulars:

	Problem	Solution
A)	Incorrect die for size tubular	Check pipe O.D. and match die size to pipe O.D.
B)	Dies have material compacted in tooth area	Clean dies with wire brush and inspect for worn teeth. Replace with new dies if necessary.
C)	Power unit pressure set incorrectly	Inspect relief valve on power unit to make sure enough system pressure is being delivered to backup.
D)	Counter balance valve not holding pressure	Remove side plates on backup. Bench test and replace the counter balance valve defective.
E)	Internal leakage in backup cylinder	Disconnect lines and bench test. Repair or replace as necessary.
F)	Jaws will not retract. Counter balance valve is stuck.	Replace counter balance valve.
G)	External leakage of cylinder	Repair or replace cylinder.
H)	Control valve set to neutral, but jaws extend	Inspect control valve for damage and/ or incorrect spool. Repair or replace as necessary.

RECOMMENDED SPARE PARTS LIST FOR REMOTE AREAS

Quantity	Part Number	Description
1	12501437	Seal for Rineer Motor
2	73013	1 1/2" Jaw Pins
2	73012	1 1/2" LF Jaw Rollers
2	73013-01	2" Jaw Pins
2	73012-01	2" Jaw Rollers
2	73012-02	2" LF Jaw Roller
4	32DU28	DU Bearing for LF Roller
2	14666	Jaw Pin for 9 5/8" - 14" DT
2	14667	Jaw Roller for 9 5/8" - 14" DT
8	1001	1/8" NPT Zerts
1	SLV1000-01	Door Switch
1	45072	Shifting Yoke Assy.
1	14711	Brake Band Assembly
1	SMH1501-L	Left Jaw Torsion Spring
1	SMH1501-M	Right Jaw Torsion Spring
2	BUCS15010	Door Rollers
1	A35-MRV-1	A-35 Relief Cartridge

SECTION 7 14" DRILL PIPE COMBO TONG AND 15" LOCKJAW™ BACKUP PARTS LISTS

CLE14000DP01 / 14" DRILL PIPE COMBO TONG ..... 7 - 5
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14612 / TOP TONG PLATE WELDMENT ..... 7 - 13
14616 / BOTTOM TONG PLATE WELDMENT ..... 7 - 13
14711 / BRAKE BAND WELDMENT ..... 7 - 13
14700 / REVERSING PIN ASSEMBLY ..... 7 - 14
14722 / REMOTE SHIFT CYLINDER ASSEMBLY ..... 7 - 15
73165 / OPEN THROAT CAM POSITIONER ..... 7 - 17
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SSCF1875 / 1 7/8" SEVERE SERVICE CAM FOLLOWER ..... 7 - 19
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CJDT76-04125 / 4 1/8" DOVETAIL JAW SET ASSEMBLY ..... 7 - 24
CJDT76-04500 / 4 1/2" DOVETAIL JAW SET ASSEMBLY ..... 7 - 24
CJDT76-04625 / 4 5/8" DOVETAIL JAW SET ASSEMBLY ..... 7 - 25
CJDT76-04750 / 4 3/4" DOVETAIL JAW SET ASSEMBLY ..... 7 - 25
CJDT76-05000 / 5" DOVETAIL JAW SET ASSEMBLY ..... 7 - 26
CJDT76-05250 / 5 1/4" DOVETAIL JAW SET ASSEMBLY ..... 7 - 26
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CJDT76-07500 / 7 1/2" DOVETAIL JAW SET ASSEMBLY ..... 7 - 30
CJDT76-07625 / 7 5/8" DOVETAIL JAW SET ASSEMBLY ..... 7 - 31
CJDT76-07812 / 7 13/16" DOVETAIL JAW SET ASSEMBLY ..... 7 - 31
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SUPERIOR MANUFACTURING

Pick List

CLE14000DP01 / 14" DP COMBO TONG 80K FT/LB

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00CLE14000DP01	PICKLIST FOR CLE14000DP01 W/REMOTE DOOR F/HYTOPS REV DATE: 11/21/03	each		1	_____
1001	ZERT 1/8" NPT	each	50	41	_____
10041	CLEVIS PIN-CLP-172S	each	M1-B	1	_____
1027	LOCKWASHER 3/8" GR8 (134)	each	50	12	_____
1029	SET SCREW 3/8"-16 X 1/2"	each	50	8	_____
1047	HHCS 3/8"-16 X 1" GR8	each	50	2	_____
1048	HHCS 3/8"-16 X 1 1/4" GR8	each	50	10	_____
1093	SHCS 1"-8 X 12"	each		4	_____
110	HHCS 1/4"-20 X 2 1/4" GR8	each	57	4	_____
1103	LOCKWASHER 1/2" GR8	each	51	10	_____
1106-A	SHCS 1/2"-13 X 1 1/2"	each	51	24	_____
1107-A	SHCS 1/2"-13 X 2 1/2"	each	51	2	_____
1110	HHCS 1/2"-13 X 1" GR8	each	51	6	_____
1111	HHCS 1/2"-13 X 1 1/4" GR8	each	51	4	_____
1151	5/8" LOCKWASHER GRADE 8	each	51	50	_____
1153	SHCS 5/8"-11 X 1"	each	56	4	_____
1158	HHCS 5/8"-11 X 1 3/4" GR8	each	55	42	_____
1170-A	HI COLLAR LOCKWASHER 3/4"	each	52	1	_____
1171	LOCKWASHER 3/4" GR8	each	52	5	_____
1174	HHCS 3/4"-10 X 2 1/4" GR8	each	52	5	_____
1213	NYLOCK NUT LOW PRO 1"-12	each	52	30	_____
1222	NUT 1 1/2"-12, IDLER GEAR	each	52	4	_____
1223	LOCKWASHER 1 1/2"	each	52	4	_____
1236	ZERT 65 DEG 1 7/32" 65 DEG HEAD ANGLE--1095K25	each	53	3	_____
12501437	POLYPACK 1/8" CROSS SECTION 1 7/16 X 1 11/16 X 1/8	each	O1-A	1	_____
1252B	COTTER PIN 1/8" X 1" SS	each	53	1	_____

SUPERIOR MANUFACTURING

Pick List

CLE14000DP01 / 14" DP COMBO TONG 80K FT/LB

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1271	SHCS 3/4"-10 X 1 3/4"	each	54	1	_____
1273	JAM NUT 1 1/2"-12 NYLOCK NF LOW PRO	each	54	4	_____
1311	SPRING PLUNGER	each	54	2	_____
1386	COUPLING 1/8" NPT X 1 1/4" L 3MSA/A105B16 3354	each	S3-D	1	_____
14007-03	TOP CAGE PLATE F/ CLE14000DP	each		1	_____
14008-02	BOTTOM CAGE PLATE F/ CLE14000DP	each		1	_____
14009-02	RING GEAR F/ CLE14000DP	each		1	_____
14018	ROD BOOTS F/ CYLINDER H-1 1/2AO2-3-1-P1 W/ THIN BAND (1/4")	each	M1-C	1	_____
14018-S1	WORM DRIVE HOSE CLAMP 15/16" TO 1 1/2" #5321K24	each	M1-C	2	_____
14070	DUMBELL ROLLER SEAL ASSEMBLY PICKLIST	each		30	_____
14603	MID-BODY F/TONG CLE14000-04 (PICKLIST)	each		1	_____
14612	TOP TONG PLATE WELDMENT F/TONG CLE14000-04 (PICKLIST)	each		1	_____
14616	BOTTOM PLATE WELDMENT PICKLIST	each		1	_____
14623	DOOR PIVOT PIN	each		2	_____
14647	CAGE PLATE SPACER	each	M2-A	4	_____
14680-01	REMOTE TONG DOOR ASSEMBLY F/CLE14000DP01 PICKLIST	each		1	_____
14700	REVERSING PIN ASSEMBLY PICKLIST	each		1	_____
14711	BRAKE BAND WELDMENT PICKLIST	each		2	_____

SUPERIOR MANUFACTURING

Pick List

CLE14000DP01 / 14" DP COMBO TONG 80K FT/LB

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
14713	LEFT LIFTING LUG WELDMENT PICKLIST	each		1	_____
14714	RIGHT LIFTING LUG WELDMENT PICKLIST	each		1	_____
14715	BRAKE LUG WELDMENT F/14" DP TONG	each		2	_____
14722	REMOTE SHIFT CYLINDER ASSY. PICKLIST	each		1	_____
1611	FLUSH PLUG 1" MNPT	each	S4-G	1	_____
1650	GAUGE 0-3000 BAC-3M-25	each	S5-A	2	_____
1652	1/8" MNPT X 1/8" FNPT 90	each	S5-B	2	_____
1901	BEARING 306 SZZ	each	S5-D	3	_____
1905	CLINCHER IDLER BEARING X-tra Heavy Duty Sealed type MODIFIED MU5212TM BEARING	each	S5-D	14	_____
1909	FAF9105KDD BEARING	each	S5-D	1	_____
1910B	TAPERED BEARING TIMK 30206 92KA1	each	S5-E	30	_____
1920	CYLINDRICAL ROLLER BEARING P/N:SL04 5005 PP	each	S5-E	1	_____
1926	SNAP RING INT. RR-433 SPIROL LOC	each	S5-E	10	_____
1946	SNAP RING EXT. 237	each	S5-F	1	_____
1948	SNAP RING INT. RRT-283	each	S5-F	1	_____
1949	SNAP RING INT. N5000-187	each	S5-F	1	_____
1950	SNAP RING EXT. N5100-100	each	S5-F	1	_____
2019	SLH-1 1/2 A02-3-1-P24P5 CYL. BRAKE CYL. S/S ROD MODIFY TANGS	each	M2-C	2	_____
202	HHCS 5/8"-11 X 2 1/2" GR8	each	57	8	_____
2044	BALL JOINT ROD END RIGHT HAND THREADS	each	M2-D	1	_____

SUPERIOR MANUFACTURING

Pick List

CLE14000DP01 / 14" DP COMBO TONG 80K FT/LB

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
2046	GARLOCK BUSHING 08DU10 1/2" ID X 5/8" F/ REAR MNT.	each	S2-F	1	_____
2095	DUMBELL ROLLER SPACER F/20" TONG	each	M2-E	30	_____
212	NYLOCK NUT 1/4"-20 GR8	each	56	4	_____
256	SHCS 5/8"-11 X 1 1/4"	each	56	8	_____
45067-S7	DOOR SWITCH BASE MOUNT	each	M4-B	2	_____
45068	WASHER	each	M4-B	1	_____
45099	DOOR CAUTION PLATES F/ ALL TONG DOORS	each	M4-C	1	_____
55022-A	DOOR SHAFT	each	M5-C	15	_____
55076	SHIFTING BOX WELDMENT PICKLIST	each	M22-A	1	_____
55084-02	DRIVE GEAR F/CLE5500	each	M6-B	1	_____
55085	MOTOR SPACER	each	M6-B	1	_____
55088	MOTOR SHAFT SEAL RETAINER	each	M6-B	1	_____
55121-01	MOTOR SHAFT BRNG. SPACER	each	M6-C	1	_____
55123-03	HIGH GEAR IDLER F/CLE7625DP TONG	each	M6-C	1	_____
55142	ENCODER ASSEMBLY F/ 5 1/2 HT 7 5/8 TONG PICKLIST	each	M6-D	1	_____
55143	TOP SECONDARY BEARING CAP	each	M6-D	1	_____
58100	Z-20-5/16/18-4-SS THREADED ORIFICE INSERT(SS)	each	M7-C	3	_____
58102	EXT. SPRING-650--.625"OD, .072" WIRE, 2.50" OAL	each	M7-C	2	_____
73040-01	MOTOR SHAFT F/CLE7625DP TONG	each	M8-E	1	_____
73055	1 3/4"-5 NUT GR8 F/ CLE7625DP-SHORT IDLER NUT	each	M8-E	1	_____
73056	LOCKWASHER 1 3/4" F/ CLE7625DP-SHORT IDLER LW	each	M8-E	1	_____

SUPERIOR MANUFACTURING

Pick List

CLE14000DP01 / 14" DP COMBO TONG 80K FT/LB

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
73066-01	UPPER PINION BEARING CAP F/CLE7625DP TONG	each	M8-F	1	_____
73070	DUMBELL ROLLER F/ CLE7625DP-60	each	M8-F	15	_____
73071	DUMBELL ROLLER SPACER F/ CLE7625DP-60	each	M8-F	15	_____
73077	IDLER GEAR F/ CLE7625DP-60	each	M8-F	3	_____
73078	OUTBOARD IDLER SHAFT CLE7625DP-60	each	M8-F	2	_____
73079-01	LOW PINION GEAR F/ CLE7625DP-60	each	M23-C	1	_____
73080-02	SECONDARY INPUT GEAR F/CLE7625DP TONG	each	M9-A	1	_____
73081-01	HIGH GEAR F/CLE7625DP-03 3-G	each	M9-B	1	_____
73082-02	PINION GEAR F/CLE7625DP-03 3-G	each	M9-B	1	_____
73083-01	UPPER LOW PINION GEAR F/CLE7625DP-03 3-G	each	M9-B	1	_____
73085	LOWER PINION BEARING CAP F/CLE7625DP-03 (3-G)	each		2	_____
73088	OUTBOARD IDLER SPACER F/ CLE7625DP-60 & 03 F/ CLE8625DP-03	each	M9-C	2	_____
73089	SHORT IDLER SHAFT F/ CLE7625DP	each		1	_____
73091	GEAR BOX COVER F/CLE7625DP-60 TONG	each		1	_____
73092	LOWER HIGH GEAR SPACER F/CLE7625DP-03 (3-G)	each	M9-C	1	_____
73093	UPPER HIGH GEAR SPACER F/CLE7625DP-03 (3-G)	each	M9-C	1	_____
73097-01	UPPER LOW SPACER F/CLE7625DP TONG	each	M9-C	1	_____
73098	UPPER SPACER F/ UPPER LOW PINION GEAR	each	M9-C	1	_____

SUPERIOR MANUFACTURING

Pick List

CLE14000DP01 / 14" DP COMBO TONG 80K FT/LB

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
73099	RINEER 21CI IN 2 SPEED MOTOR 015-65-021-031-71 W/HIGH PRESSURE SEAL	each	S1-C	1	_____
73165	OPEN THROAT CAM POSITION ASSEMBLY PICKLIST	each		1	_____
76128	DOOR SWITCH BASE WELDMENT PICKLIST	each	M10-E	1	_____
82036	IDLER GEAR F/CLE9625DP TONG	each	M23-D	2	_____
82037	IDLER RACE F/CLE9625DP TONG	each		4	_____
82038	IDLER SHAFT F/CLE9625DP TONG	each		2	_____
82063	IDLER SPACER F/CLE9625DP TONG	each	M11-A	4	_____
82080-02	LYNAIR CYLINDER LH-2 B02-6-1-P1	each		1	_____
CM4554	3/8" CHECK VALVE	each	M17-E	2	_____
CRSS20021	1/4" NPT SHUTTLE VALVE ASH-25-1	each	M18-D	1	_____
HTS15060	TONG MANIFOLD WELDMENT F/ HYTOPS15000 PICKLIST	each		2	_____
SLV1000-01	N.C. SELF LUBRICATED VALVE NORMALLY CLOSED/DOOR SWITCH PICKLIST	each	M19-C	3	_____
SSCF1875	1 7/8" SEVERE SERVICE CAM FOLLOWER ASSEMBLY PICKLIST F/ CLE7625DP	each	M19-E	38	_____

SUPERIOR MANUFACTURING

Pick List

14680-01 / REMOTE TONG DOOR ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
0014680-01	PICKLIST FOR 14680-01 F/CLE14000DP01 REV DATE: 02/10/03	each		1	_____
1001	ZERT 1/8" NPT	each	50	8	_____
1024	NUT 3/8"-16	each	50	2	_____
1060	HHCS 3/8"-16 X 2 1/2" GR8	each	51	2	_____
1101	NUT 1/2"-13 GR8	each	51	1	_____
1128	HHCS 1/2"-13 X 11"	each	54	1	_____
1323	1" - 14 NYLOCK JAM NUT	each	54	8	_____
14308	DUMBELL ROLLER FOR DOOR F/14" COMBO TONG	each		3	_____
14604-S1	TONG DOOR PLATE	each		2	_____
14676	DOOR ROLLER SPACER	each		6	_____
14677	DOOR DUMBELL SHAFT	each		3	_____
14678	DOOR PIVOT SHAFT	each		1	_____
14679	DOOR PIVOT BUSHING	each		3	_____
14681	DOOR LATCH WELDMENT	each		1	_____
14682	DOOR LATCH PIVOT PIN	each		1	_____
14686	DOOR LATCH LINKAGE	each		1	_____
14716	DOOR PIVOT LINKAGE	each		1	_____
14734	DOOR ARM SPACER F/REMOTE DOOR F/CLE14000D	each		1	_____
1676	SHOULDER BOLT 3/4" X 5/8" L 18-8 SS 5/8-11 THREAD	each	S5-B	1	_____
1682	3/4" X 1 1/2" SHOULDER BOLT F/14" TONG F/REMOTE DOOR	each		1	_____
2021	GARLOCK BUSHING 24DU16 1 1/2" ID X 1" DOOR BUSHING	each	S2-G	5	_____
2025	TONG DOOR THRUST SPACER	each		3	_____
2040	TONG DOOR BUSHING F 20" CASING TONG	each	M2-D	2	_____
55027	DOOR BUSHING	each	M5-D	1	_____

SUPERIOR MANUFACTURING

Pick List

14680-01 / REMOTE TONG DOOR ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
55191	DUMBELL ROLLER BUSHING F/5 1/2 UHT TONG	each	M6-D	6	_____
55192	DUMBELL ROLLER SPACER	each	M6-D	6	_____
73071	DUMBELL ROLLER SPACER F/ CLE7625DP-60	each	M8-F	3	_____
73101-S1	TONG DOOR COVER F/ CLE7625DP-60	each		1	_____
76113-S5	DOOR SWITCH COLLAR	each	M10-D	1	_____
76131	DOOR SWITCH ADJ. SLEEVE	each	M10-E	1	_____
82042	ARM F/CLE9625DP TONG	each		1	_____
SMH1501-N	TORSION SPRING	each		1	_____

27-Jan-03
7:44 AM

SUPERIOR MANUFACTURING

Pick List

14612 / TOP TONG PLATE WELDMENT

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
14612-S1	TOP TONG PLATE F/TONG CLE14000-04	each		1	_____
51067-S2	BRAKE BAND PIN	each	M4-F	1	_____
55063-S4	BEARING RETAINR F/MTR. SHFT	each	M6-A	1	_____
55124-01	HIGH GEAR IDLER SHAFT	each	M6-C	1	_____
73074-S2	MID PINION BEARING RETAINER F/CLE7625DP-60 (3-G)	each		2	_____
73090-01	LOW GEAR HOUSING F/TONG CLE8625DP-05 (PICK LIST)	each		1	_____

27-Jan-03
7:45 AM

SUPERIOR MANUFACTURING

Pick List

14616 / BOTTOM PLATE WELDMENT

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
14616-S1	BOTTOM PLATE	each		1	_____
51067-S2	BRAKE BAND PIN	each	M4-F	1	_____

17-Feb-03
2:48 PM

SUPERIOR MANUFACTURING

Pick List

14711 / BRAKE BAND WELDMENT

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1101	NUT 1/2"-13 GR8	each	51	1	_____
14711-S1	BRAKE BAND RING	each		1	_____
14712	BRAKE PAD .25" X 2" X 67" MATERIAL P/N 1663	each		1	_____
78021-S2	BRAKE BAND GUSSET	each	M10-E	1	_____
78021-S4	BRAKE BAND EYELET	each	M10-E	1	_____

SUPERIOR MANUFACTURING

Pick List

14700 / REVERSING PIN ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
100	NUT 1/4"-20 GR.8	each	55	8	_____
101	LOCKWASHER 1/4" GR8	each	55	8	_____
1024	NUT 3/8"-16	each	50	3	_____
107	HHCS 1/4"-20 X 1 1/2" GR8	each	55	8	_____
1103	LOCKWASHER 1/2" GR8	each	51	4	_____
1112	HHCS 1/2"-13 X 1 1/2" GR8	each	51	4	_____
13606	REVERSING PIN CYLINDER 1 1/2" B, 2"S W/5/8"R STAINLESS ROD	each	M1-C	2	_____
144	HHCS 3/8"-16 X 2 1/2" GR8	each	57	3	_____
14701	REVERSING CYLINDER MOUNT WELDMENT PICKLIST	each		1	_____
71073	LOCKING PIN CROSS BAR 7 5/8" LOCKJAW TONG	each	M8-A	2	_____
73106	AUTO REVERSING PIN	each		2	_____
78058	REVERSING PIN PIVOT STUD	each		1	_____

SUPERIOR MANUFACTURING

Pick List

14722 / REMOTE SHIFT CYLINDER ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1004	DRIVE ZERT 3/16"	each	50	1	_____
10041	CLEVIS PIN-CLP-172S	each	M1-B	2	_____
1025	FLATWASHER 3/8" GR8	each	50	2	_____
1027	LOCKWASHER 3/8" GR8 (134)	each	50	2	_____
1046	HHCS 3/8"-16 X 3/4" GR8	each	50	1	_____
1071	HHCS 3/8"-16 X 3 1/2" GR8	each	51	1	_____
1099	ROD CLEVIS-RC-0605	each	51	1	_____
1176-B	NYLOCK NUT LO PRO 3/4"-16	each	52	1	_____
1252B	COTTER PIN 1/8" X 1" SS	each	53	2	_____
14723	SHIFT CYLINDER LINK	each		1	_____
14724	SHIFTER ARM WELDMENT PICKLIST	each		1	_____
14726	CYLINDER MOUNT	each		1	_____
1942-A	EXTERNAL SNAP RING ARTCO 1500-X74	each	S5-F	2	_____
2046	GARLOCK BUSHING 08DU10 1/2" ID X 5/8" F/ REAR MNT.	each	S2-F	1	_____
2047	AUTO SHIFT CYL. LH-11/2-BO2-2-1-P1 LYNAIR W/STAINLESS ROD	each		1	_____
2079	SPRING HOUSING F/AUTO SHIFT ASSY. 20" CASING TONG	each		1	_____
2080	PISTON ROD F/AUTO SHIFT ASSY. 20" CASING TONG	each		1	_____
2081	END CAP F/AUTO SHIFT ASSY. 20" CASING TONG	each		1	_____
45072	SHIFTING YOKE WELDMENT PICK LIST	each	M4-B	1	_____
45092	FLANGE BEARING SELF-LUBR	each	M4-C	1	_____
45106	FLANGE BEARING MOD.SPLIT SELF-LUBRICA.	each	M4-D	1	_____

SUPERIOR MANUFACTURING

Pick List

14722 / REMOTE SHIFT CYLINDER ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
45143	SHIFTER SHAFT	each	M4-D	1	_____
45164	SHIFTING YOKE BEARING PIN NEW F/9 5/8 DP TONG	each	M4-D	2	_____
73065	E-TYPE RETAINER RING ET-403-7-2100 E-CLIP	each	M8-E	2	_____
82057	END CAP F/AUTO SHIFT SPRING HOUSING F/CLE9625DP TONG	each		1	_____
82106	CLEVIS PIN F/CLE9625DP TONG	each		1	_____
959-1	1/2" ROD WIPER	each	O3-F	1	_____
BUCS4024	B1000-035 BELVILLE SPRING B4-25-89	each	M14-C	66	_____

SUPERIOR MANUFACTURING

Pick List

73165 / OPEN THROAT CAM POSITIONER

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1001	ZERT 1/8" NPT	each	50	1	_____
10056	CAM SWITCH MTNG. BRACKET F/CLE1075-02 REMOTE TONG	each	M1-B	2	_____
1016	COTTER PIN 5/32" X 1" OAL	each	50	2	_____
1024	NUT 3/8"-16 SAME AS P/N 133	each	50	4	_____
1025	FLATWASHER 3/8" GR8 SAME AS P/N 135	each	50	4	_____
1027	LOCKWASHER 3/8" GR8 (134) SAME AS P/N 134	each	50	8	_____
1041	SHCS 3/8"-16 X 1" SAME AS P/N-236	each	50	3	_____
1047	HHCS 3/8"-16 X 1" GR8 SAME AS P/N 138	each	50	4	_____
1103	LOCKWASHER 1/2" GR8 SAME AS P/N 166	each	51	4	_____
1106-A	SHCS 1/2"-13 X 1 1/2" SAME AS P/N 248	each	51	2	_____
1112	HHCS 1/2"-13 X 1 1/2" GR8 SAME AS P/N 170	each	51	4	_____
141	HHCS 3/8"-16 X 1 3/4" GR8	each	57	2	_____
144	HHCS 3/8"-16 X 2 1/2" GR8 REFER TO P/N-1060	each		2	_____
1915	5203SBKFF BEARING .693 ID x 1.5748 OD x .6875W static load rate: 2020 lbf	each	S5-E	2	_____
1939	SNAP RING EXT. RST-59	each	S5-E	4	_____
1940-A	INNER RACE (IR-7173-C, MI-11-N)	each	S5-E	2	_____
2056	CAM SWITCH MOUNTING BRACKET DUBBLER	each	M2-D	1	_____
2069	HHCS 1/4"-20 X 6" GR8	each	M2-E	4	_____
212	NYLOCK NUT 1/4"-20 GR8	each	56	4	_____
72040	SNAP RING EXT. RST-75	each	M8-C	1	_____
73157	UPPER MOUNTING PLATE	each	M9-D	1	_____

14-Apr-03
10:42 AM

SUPERIOR MANUFACTURING

Pick List

73165 / OPEN THROAT CAM POSITIONER

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
73158	MID MOUNTING PLATE	each		1	_____
73159	BOTTOM MOUNTING PLATE	each		1	_____
73161	CAM PLATE	each		2	_____
73163	CAM MOUNT	each		1	_____
73167	CAM PLATE GUIDE	each		1	_____
73168	OUTER CAM PLATE	each		1	_____
73170	CAM SWITCH FLAP WELDMENT PICK LIST	each		2	_____
73172	CAM SWITCH MID PLATES	each		2	_____
73174	OUTER CAM PLATE	each		1	_____
73179	VALVE LEG	each	M9-D	7	_____
73188	EXTENSION SPRING 3/4 OD X 1 7/8 L X .075 W	each	M9-D	1	_____
SLV1000-01	N.C. SELF LUBRICATED VALVE NORMALLY CLOSED/DOOR SWITCH PICKLIST	each	M19-C	3	_____

8-Apr-03
3:54 PM

SUPERIOR MANUFACTURING

Pick List

HTS15060 / TONG MANIFOLD WELDMENTS

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1374	THREADED COUPLING 1/4" 3000 PSI (WELDED)	each	S3-D	8	_____
1375	THRDED.COUPLING 3/8" 3000P	each	S3-D	1	_____
HTS15060-S1	MANIFOLD PLATE F/ HYTOPS15000	each		1	_____

SUPERIOR MANUFACTURING

Pick List

SSCF1875 / 1 7/8" SEVERE SERVICE CAM FOLLOWER

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00SSCF1875	PICKLIST FOR SSCF1875 REV DATE: 09/08/99 SEE NOTES F/SSCF1875	each		1	_____
1178	JAM NUT 7/8"-14	each	52	1	_____
1224	LOCKWASHER 7/8" GR8 HEAVY SPLIT	each	52	1	_____
1257	DRIVE ZERT 1/4"	each	53	1	_____
73007	CAM FOLLOWER RACE F/ CLE7625DP	each	M8-C	1	_____
73008	CAM FOLLOWER STUD F/ CLE7625DP	each	M8-D	1	_____
73009	FLANGE BUSHING 20FDU16 F/ CLE7625DP	each	S2-G	1	_____

SUPERIOR MANUFACTURING

Pick List

14693 / LEFT JAW ADAPTER ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10039	DOWEL PIN 5/8" X 1" OAL	each	M1-B	2	_____
1048	HHCS 3/8"-16 X 1 1/4" GR8	each	50	1	_____
1171	LOCKWASHER 3/4" GR8	each	52	2	_____
1176	HHCS 3/4"-10 X 3" GR8	each	52	2	_____
1176-A	NUT COARSE 3/4" GR8	each	52	2	_____
14689	TOP LEFT JAW ADAPTOR F/CLE14000DP-02	each		1	_____
14690	BOTTOM LEFT JAW ADAPTOR F/CLE14000DP-02	each		1	_____
14695	DOOR PIVOT LOCK	each	M2-A	1	_____
14697	JAW PUSHER F/DOOR ASSEMBLY 14693/14694	each		1	_____
14699	EXTENSION SPRING	each	M2-A	1	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	1	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	1	_____
BUCT7631	1/2 x 1 1/2 EYE BOLT CROSBY#9900217	each		2	_____

SUPERIOR MANUFACTURING

Pick List

14694 / RIGHT JAW ADAPTER ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10039	DOWEL PIN 5/8" X 1" OAL	each	M1-B	2	_____
1048	HHCS 3/8"-16 X 1 1/4" GR8	each	50	1	_____
1171	LOCKWASHER 3/4" GR8	each	52	2	_____
1176	HHCS 3/4"-10 X 3" GR8	each	52	2	_____
1176-A	NUT COARSE 3/4" GR8	each	52	2	_____
14691	TOP RIGHT JAW ADAPTOR F/CLE14000DP-02	each		1	_____
14692	BOTTOM RIGHT JAW ADAPTOR F/CLE14000DP-02	each		1	_____
14695	DOOR PIVOT LOCK	each	M2-A	1	_____
14697	JAW PUSHER F/DOOR ASSEMBLY 14693/14694	each		1	_____
14699	EXTENSION SPRING	each	M2-A	1	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	1	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	1	_____
BUCT7631	1/2 x 1 1/2 EYE BOLT CROSBY#9900217	each		2	_____

31-Mar-03
10:33 AM

SUPERIOR MANUFACTURING

Pick List

CJDT76-03375 / 3 3/8" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-03375	TONG JAW F/CJDT76-03375 assy 3-3/8" F/7-5/8" & 8-5/8" DP TONG	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
7:21 AM

SUPERIOR MANUFACTURING

Pick List

CJDT76-03500 / 3 1/2" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-03500	TONG JAW 7 5/8 - 3 1/2	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
1:29 PM

SUPERIOR MANUFACTURING

Pick List

CJDT76-04125 / 4 1/8" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-04125	TONG JAW F/CJDT76-04125 ASSY 4 1/8" F/ 7 5/8" & 8 5/8" DP TONG	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
1:32 PM

SUPERIOR MANUFACTURING

Pick List

CJDT76-04500 / 4 1/2" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-04500	4 1/2 TONG JAW F/ CJDT76-04500 JAW ASSY	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
1:35 PM

SUPERIOR MANUFACTURING

Pick List

CJDT76-04625 / 4 5/8" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-04625	4 5/8" DOVETAIL JAW F/7 5/8 & 8 5/8 DRILLPIPE TONG ASSY#CJDT76-04625	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
1:36 PM

SUPERIOR MANUFACTURING

Pick List

CJDT76-04750 / 4 3/4" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-04750	4 3/4" DOVETAIL JAW F/7 5/8 & 8 5/8 DRILLPIPE TONG ASSY#CJDT76-04750	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
1:39 PM

SUPERIOR MANUFACTURING

Pick List

CJDT76-05000 / 5" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-05000	TONG JAW F/CJDT76-05000 assy 5" F/7-5/8" & 8-5/8" DP TONG	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
11:28 AM

SUPERIOR MANUFACTURING

Pick List

CJDT76-05250 / 5 1/4" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-05250	TONG JAW F/CJDT76-05250 assy 5-1/4" F/7-5/8" & 8-5/8" DP TONG	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
1:40 PM

SUPERIOR MANUFACTURING

Pick List

CJDT76-05500 / 5 1/2" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-05500	TONG JAW F/CJDT76-05500 assy 5-1/2" F/7-5/8" & 8-5/8" DP TONG	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
11:34 AM

SUPERIOR MANUFACTURING

Pick List

CJDT76-06250 / 6 1/4" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-06250	TONG JAW F/CJDT76-06250 assy 6-1/4" F/7-5/8" & 8-5/8" DP TONG	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
1:43 PM

SUPERIOR MANUFACTURING

Pick List

CJDT76-06375 / 6 3/8" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-06375	TONG JAW F/CJDT76-06375 DRILL PIPE	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
1:49 PM

SUPERIOR MANUFACTURING

Pick List

CJDT76-06500 / 6 1/2" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
			57		
148	HHCS 3/8"-16 X 4" GR8	each	M9-D	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M8-D&M23-B	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each		2	_____
73014-06500	6 1/2" DOVETAIL JAW F/7 5/8 & 8 5/8 DRILLPIPE TONG ASSY#CJDT76-06500	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
1:50 PM

SUPERIOR MANUFACTURING

Pick List

CJDT76-06625 / 6 5/8" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-06625	TONG JAW F/CJDT76-06625 assy 6-5/8" F/7-5/8" & 8-5/8" DP TONG	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
1:51 PM

SUPERIOR MANUFACTURING

Pick List

CJDT76-07000 / 7" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-07000	7" DOVETAIL JAW F/7 5/8 & 8 5/8 DP TONG ASSY #CJDT76-07000	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
1:52 PM

SUPERIOR MANUFACTURING

Pick List

CJDT76-07250 / 7 1/4" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-07250	TONG JAW F/CJDT76-07250 assy 7" thru 7-1/4" F/7-5/8" & 8-5/8" DP TONG	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
1:53 PM

SUPERIOR MANUFACTURING

Pick List

CJDT76-07500 / 7 1/2" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-07500	7 1/2" JAW F/CJDT76-07500 ASSEMBLY	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

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SUPERIOR MANUFACTURING

Pick List

CJDT76-07625 / 7 5/8" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-07625	7 5/8"DOVETAIL JAW F/ 7 5/8 & 8 5/8 TONG ASSY #CJDT76-07625	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
1:56 PM

SUPERIOR MANUFACTURING

Pick List

CJDT76-07812 / 7 13/16" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73014-07812	7 13/16" DOVETAIL JAW F/CLE7625DP TONG ASSY.#CJDT76-07812	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

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1:57 PM

SUPERIOR MANUFACTURING

Pick List

CJDT86-08000 / 8" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
86014-08000	8" DOVETAIL JAW F/CLE8625DP-60	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
1:58 PM

SUPERIOR MANUFACTURING

Pick List

CJDT86-08625 / 8 5/8" DOVETAIL JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
86014-08625	TONG JAW F/CJDT86-08625 assy 8-5/8" F/8-5/8" DP TONG	each		2	_____
DTI1602	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 5" L STRAIGHT TOOTH	each		4	_____

31-Mar-03
2:05 PM

SUPERIOR MANUFACTURING

Pick List

CJDT14X09625 / DT JAW SET 14" DP X 9 5/8" ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
1071	HHCS 3/8"-16 X 3 1/2" GR8	each	51	2	_____
14620-09625	LEFT DOVETAIL JAW 9 5/8" F/ 14" DP TONG	each		1	_____
14621-09625	RIGHT DOVETAIL JAW 9 5/8" F/ 14" DP TONG	each		1	_____
14666	JAW PIN	each	M2-A	2	_____
14667	JAW ROLLER	each	M2-A	2	_____
DTI1601	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 3 7/8" L STRAIGHT TOOTH	each		8	_____

31-Mar-03
2:07 PM

SUPERIOR MANUFACTURING

Pick List

CJDT14X09875 / DT JAW SET 14" DP X 9 7/8" ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
1071	HHCS 3/8"-16 X 3 1/2" GR8	each	51	2	_____
14620-09875	LEFT DOVETAIL JAW 9 7/8" F/ 14" DP TONG	each		1	_____
14621-09875	RIGHT DOVETAIL JAW 9 7/8" F/ 14" DP TONG	each		1	_____
14666	JAW PIN	each	M2-A	2	_____
14667	JAW ROLLER	each	M2-A	2	_____
DTI1601	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 3 7/8" L STRAIGHT TOOTH	each		8	_____

31-Mar-03
3:54 PM

SUPERIOR MANUFACTURING

Pick List

CJDT14X10750 / DT JAW SET 14" DP X 10 3/4" ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
1071	HHCS 3/8"-16 X 3 1/2" GR8	each	51	2	_____
14620-10750	LEFT DOVETAIL JAW 10 3/4" F/ 14" DP TONG	each		1	_____
14621-10750	RIGHT DOVETAIL JAW 10 3/4" F/ 14" DP TONG	each		1	_____
14666	JAW PIN	each	M2-A	2	_____
14667	JAW ROLLER	each	M2-A	2	_____
DTI1601	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 3 7/8" L STRAIGHT TOOTH	each		8	_____

31-Mar-03
2:18 PM

SUPERIOR MANUFACTURING

Pick List

CJDT14X11750 / DT JAW SET 14" DP X 11 3/4" ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
1071	HHCS 3/8"-16 X 3 1/2" GR8	each	51	2	_____
14620-11750	LEFT DOVETAIL JAW 11 3/4" F/ 14" DP TONG	each		1	_____
14621-11750	RIGHT DOVETAIL JAW 11 3/4" F/ 14" DP TONG	each		1	_____
14666	JAW PIN	each	M2-A	2	_____
14667	JAW ROLLER	each	M2-A	2	_____
DTI1601	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 3 7/8" L STRAIGHT TOOTH	each		8	_____

31-Mar-03
2:12 PM

SUPERIOR MANUFACTURING

Pick List

CJDT14X11875 / DT JAW SET 14" DP X 11 7/8" ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
1071	HHCS 3/8"-16 X 3 1/2" GR8	each	51	2	_____
14620-11875	LEFT DOVETAIL JAW 11 7/8" F/ 14" DP TONG	each		1	_____
14621-11875	RIGHT DOVETAIL JAW 11 7/8" F/ 14" DP TONG	each		1	_____
14666	JAW PIN	each	M2-A	2	_____
14667	JAW ROLLER	each	M2-A	2	_____
DTI1601	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 3 7/8" L STRAIGHT TOOTH	each		8	_____

31-Mar-03
2:14 PM

SUPERIOR MANUFACTURING

Pick List

CJDT14X13375 / DT JAW SET 14" DP X 13 3/8" ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
1071	HHCS 3/8"-16 X 3 1/2" GR8	each	51	2	_____
14620-13375	LEFT DOVETAIL JAW 13 3/8" F/ 14" DP TONG	each		1	_____
14621-13375	RIGHT DOVETAIL JAW 13 3/8" F/ 14" DP TONG	each		1	_____
14666	JAW PIN	each	M2-A	2	_____
14667	JAW ROLLER	each	M2-A	2	_____
DTI1601	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 3 7/8" L STRAIGHT TOOTH	each		8	_____

31-Mar-03
2:15 PM

SUPERIOR MANUFACTURING

Pick List

CJDT14X13625 / DT JAW SET 14" DP X 13 5/8" ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
1071	HHCS 3/8"-16 X 3 1/2" GR8	each	51	2	_____
14620-13625	LEFT DOVETAIL JAW 13 5/8" F/ 14" DP TONG	each		1	_____
14621-13625	RIGHT DOVETAIL JAW 13 5/8" F/ 14" DP TONG	each		1	_____
14666	JAW PIN	each	M2-A	2	_____
14667	JAW ROLLER	each	M2-A	2	_____
DTI1601	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 3 7/8" L STRAIGHT TOOTH	each		8	_____

31-Mar-03
2:17 PM

SUPERIOR MANUFACTURING

Pick List

CJDT14X14000 / DT JAW SET 14" DP X 14" ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1027	LOCKWASHER 3/8" GR8 (134)	each	50	4	_____
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4	_____
1071	HHCS 3/8"-16 X 3 1/2" GR8	each	51	2	_____
14620-14000	LEFT DOVETAIL JAW 14" F/ 14" DP TONG	each		1	_____
14621-14000	RIGHT DOVETAIL JAW 14" F/ 14" DP TONG	each		1	_____
14666	JAW PIN	each	M2-A	2	_____
14667	JAW ROLLER	each	M2-A	2	_____
DTI1601	DOVETAIL STRIP DIE 0.500" T 1 1/4" W X 1/2" T X 3 7/8" L STRAIGHT TOOTH	each		8	_____

13-Mar-03
9:13 AM

SUPERIOR MANUFACTURING

Pick List

CJ-LF-76D / 5 1/2" - 2 3/8" DP LF JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1040-A	SHCS 3/8"-16 X 3/4"	each	50	8	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
72025	GARLOCK BUSHING 24DU24 1 1/2" ID X 1 1/2" F/ PIVOT PIN	each	S2-G	2	_____
73012	1.500" LOW FRICT. JAW ROLLER F/ CLE7625DP	each	M8-D	2	_____
73013	1.500" LOW FRICTION JAW PIN F/ CLE7625DP	each	M8-D	2	_____
73063	TONG JAW ASSY. F/CJ-LF-76D 2-1/6" thru 5-1/2" F/8-5/8" DP TONG	each		2	_____
73064	SPLINE JAW CLIPS F/ CLE7625DP FITS 73062 & 73063	each	M8-E	8	_____
BUCS4027	GARLOCK BUSHING 24DU32 1 1/2" X 2" F/DOOR ROLLER	each	S2-G	2	_____

13-Mar-03
9:48 AM

SUPERIOR MANUFACTURING

Pick List

CJ-LF-86B / 8 5/8" - 5 1/2" UHT LF JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1040-A	SHCS 3/8"-16 X 3/4"	each	50	8	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
72025	GARLOCK BUSHING 24DU24 1 1/2" ID X 1 1/2" F/ PIVOT PIN	each	S2-G	2	_____
73012	1.500" LOW FRICT. JAW ROLLER F/ CLE7625DP	each	M8-D	2	_____
73013	1.500" LOW FRICTION JAW PIN F/ CLE7625DP	each	M8-D	2	_____
73064	SPLINE JAW CLIPS F/ CLE7625DP FITS 73062 & 73063	each	M8-E	8	_____
86092	TONG JAW F/CJ-LF-86B 5 1/2 THRU 8 5/8 F/ CLE8625DP TONG	each		2	_____

17-Feb-03
8:22 AM

SUPERIOR MANUFACTURING

Pick List

CJ-76C / 7 5/8" - 5 1/2" DP UHT JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1040-A	SHCS 3/8"-16 X 3/4"	each	50	8	_____
148	HHCS 3/8"-16 X 4" GR8	each	57	2	_____
73012-01	2" JAW ROLLER F/CLE7625DP	each	M9-D	2	_____
73013-01	2" JAW PIN F/CLE7625DP	each	M8-D&M23-B	2	_____
73062	TONG JAW F/CJ-76C assy. 5-1/2" thru 7-5/8" F/7-5/8" DP TONG	each		2	_____
73064	SPLINE JAW CLIPS F/ CLE7625DP FITS 73062 & 73063	each	M8-E	8	_____

17-Feb-03
8:23 AM

SUPERIOR MANUFACTURING

Pick List

CJ-86A / 8 5/8" - 5 1/2" SPLINED JAW SET ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10035-01	JAW SPRING RETAINER POST F/10 3/4" TONG	each	M1-B	4	_____
1040-A	SHCS 3/8"-16 X 3/4"	each	50	4	_____
73064	SPLINE JAW CLIPS F/ CLE7625DP FITS 73062 & 73063	each	M8-E	8	_____
86012	ROLLER, JAW	each	M11-A	2	_____
86013	JAW PIN F/ 8 5/8 SPLINE JAW F/ CLE8625DP-60	each	M11-A	2	_____
86062	TONG JAW F/CJ-86A assy. 5-1/2" thru 8-5/8" F/8-5/8" DP TONG	each		2	_____

SUPERIOR MANUFACTURING

Pick List

BUCDP15000 / 15" DRILL PIPE BACKUP

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1001	ZERT 1/8" NPT	each	50	8	_____
116	HHCS 1/4"-20 X 4 1/2" GR8	each		2	_____
1167	NYLOCK NUT 3/4"-10	each	52	8	_____
1171	LOCKWASHER 3/4" GR8	each	52	12	_____
1176	HHCS 3/4"-10 X 3" GR8	each	52	20	_____
1277	SHCS 3/4"-10 X 2 1/4" GR8	each	54	26	_____
1376	THRDED.COUPLING 1/2" 3000PSI	each	S3-D	2	_____
1611	FLUSH PLUG 1" MNPT	each	S4-G	4	_____
1650	GAUGE 0-3000 BAC-3M-25	each	S5-A	1	_____
212	NYLOCK NUT 1/4"-20 GR8	each	56	2	_____
283	3/4-10 HEX NUT	each		12	_____
BUC5524	PILOT OPER CHK VALVE-STEEL (5000 PSI)	each	M12-C	1	_____
BUCDP15005	OUTSIDE DOOR ASSEMBLY	each		1	_____
BUCDP15006	CYLINDER ASSEMBLY	each		1	_____
BUCDP15008	CYLINDER GUIDE	each		4	_____
BUCDP15015	INSIDE DOOR ASSEMBLY	each		1	_____
BUCDP15022	LOAD CELL PLATE WELDMENT	each		2	_____
BUCDP15034	COLUMN WELDMENT PICKLIST	each		2	_____
BUCDP15052	BOTTOM PLATE WELDMENT	each		1	_____
BUCDP15053	TOP PLATE WELDMENT	each		1	_____
BUCDP9618	DOOR PIVOT BUSHING	each	M13-B	2	_____
BUCDP9621	BACKUP PIVOT PIN	each		2	_____
BUCDP9640	HI-PSI CAM SWITCH VALVE ASSY. PICKLIST	each		1	_____
BUCDP9648	BACKUP SPACER	each	M13-B	9	_____
BUCT7636	SAFETY CHAIN ASSEMBLY	each		4	_____
CLEBU1664	1/2" FLOW CONTROL VALVE F800S	each		2	_____

21-Nov-03
2:57 PM

SUPERIOR MANUFACTURING

Pick List

BUCDP15000 / 15" DRILL PIPE BACKUP

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
CM4554	3/8" CHECK VALVE	each	M17-E	1	_____
CM7654	PSI REDUCING VALVE (SUN) 3/8 NPT PORTS	each	M18-C	1	_____
CRSS20016	SUN-Relief Valve SUN- P/N: RPEC-LDN-FAA	each	M18-D	1	_____

8-Apr-03
3:12 PM

SUPERIOR MANUFACTURING

Pick List

BUCDP15006 / CYLINDER ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1036	FLAT SHCS 3/8"-16 X 1 1/4"	each	54	6	_____
1106-A	SHCS 1/2"-13 X 1 1/2"	each	51	4	_____
1208	SHCS 3/4"-10 X 6" GR8	each	52	2	_____
1247	SHCS 3/4"-10 X 7" GR8	each	53	2	_____
1314	SHCS 1"-8 X 3" GR8	each	54	4	_____
1320	SHCS 3/4"-10 X 3" GR8	each	54	8	_____
ASAP9625	SEAL KIT F/9 5/8 DP & 15 DP BACKUP CYLINDER ASSEMBLY	each	O4-A	1	_____
BUCDP15017	OUTSIDE DOOR WEDGE	each		1	_____
BUCDP15019	INSIDE DOOR WEDGE	each		1	_____
BUCDP15027	ROD WELDMENT PICK LIST	each		1	_____
BUCDP15032	CYLINDER	each		1	_____
BUCDP15033	CYLINDER INSERT	each		1	_____
BUCDP15058	BACKUP HI-PSI CAM PLATE	each		1	_____
BUCDP9604	PISTON	each		1	_____
BUCDP9635	GLAND	each		1	_____
BUCDP9636	CYLINDER KEY F/BUCDP9625	each		1	_____
BUCST1508	TOP & BOTTOM JAW CLIP F/15" LJ BU	each	M15-C	2	_____

SUPERIOR MANUFACTURING

Pick List

ASAP9625 / SEAL KIT F/9 5/8 DP & 15 DP

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
25004250	POLYPACK 1/4" CROSS SECTION 4 1/4 X 4 3/4 X 1/4	each		1	_____
37506000	POLYPACK 3/8" CROSS SECTION 6 X 6 3/4 X 3/8	each	O1-E	1	_____
37508250	POLYPACK 3/8" CROSS SECTION 8 1/4 X 9 X 3/8	each	O1-F	1	_____
50008000	POLYPACK 1/2" CROSS SECTION 8 X 9 X 1/2	each	O1-G	2	_____
H6000	ROD WIPER - URETHANE	each		1	_____
W2-62500750	WEAR BAND	each		1	_____

SUPERIOR MANUFACTURING

Pick List

BUCDP15015 / INSIDE DOOR ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1001	ZERT 1/8" NPT	each	50	2	_____
1036	FLAT SHCS 3/8"-16 X 1 1/4"	each	54	6	_____
1210	HEX NUT 1"-8 GR8	each	57	2	_____
1218	1" LOCKWASHER GR8	each	52	2	_____
1316	HHCS 1"-8 X 10 1/2" GR8	each		2	_____
1326	SHCS 1"-8 X 8 1/2"	each	54	1	_____
36DU32	GARLOCK BUSHING 36DU32 2 1/4" ID X 2"	each		2	_____
48DU40	GARLOCK BUSHING 48DU40 3" ID X 2 1/2"	each		2	_____
48DU72	GARLOCK BUSHING 48DU72 3" ID X 4 1/2"	each		1	_____
BUCDP15012	BOTTOM INSIDE DOOR PLATE	each		1	_____
BUCDP15013	TOP INSIDE DOOR PLATE	each		1	_____
BUCDP15020	CYLINDER INSERT	each		1	_____
BUCDP15035	DOOR SPRING SPACER	each		1	_____
BUCDP9609	INSERT PIVOT PIN	each	M13-B	1	_____
BUCDP9610	DOOR ROLLER	each		1	_____
BUCDP9611	DOOR ROLLER PIN	each	M22-C	1	_____
BUCDP9637	DOOR SPACER	each		3	_____
BUCDP9651	PIVOTING INSERT SPRING	each		1	_____
BUCDP9654	INSERT SPRING SPACER	each		2	_____
BUCST1508	TOP & BOTTOM JAW CLIP F/15" LJ BU	each	M15-C	2	_____
SMH1501-M	3 1/2 I.D x 9/16 W x 50#/DEG RIGHT-HAND TORSION SPRING	each	M21-B	1	_____

SUPERIOR MANUFACTURING

Pick List

BUCDP15005 / OUTSIDE DOOR ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1001	ZERT 1/8" NPT	each	50	2	_____
1036	FLAT SHCS 3/8"-16 X 1 1/4"	each	54	6	_____
1210	HEX NUT 1"-8 GR8	each	57	2	_____
1218	1" LOCKWASHER GR8	each	52	2	_____
1316	HHCS 1"-8 X 10 1/2" GR8	each		2	_____
1326	SHCS 1"-8 X 8 1/2"	each	54	1	_____
36DU32	GARLOCK BUSHING 36DU32 2 1/4" ID X 2"	each		2	_____
48DU40	GARLOCK BUSHING 48DU40 3" ID X 2 1/2"	each		2	_____
48DU72	GARLOCK BUSHING 48DU72 3" ID X 4 1/2"	each		1	_____
BUCDP15003	TOP OUTSIDE DOOR PLATE	each		1	_____
BUCDP15007	BOTTOM OUTSIDE DOOR PLATE	each		1	_____
BUCDP15020	CYLINDER INSERT	each		1	_____
BUCDP15035	DOOR SPRING SPACER	each		1	_____
BUCDP9609	INSERT PIVOT PIN	each	M13-B	1	_____
BUCDP9610	DOOR ROLLER	each		1	_____
BUCDP9611	DOOR ROLLER PIN	each	M22-C	1	_____
BUCDP9637	DOOR SPACER	each		3	_____
BUCDP9651	PIVOTING INSERT SPRING	each		1	_____
BUCDP9654	INSERT SPRING SPACER	each		2	_____
BUCST1508	TOP & BOTTOM JAW CLIP F/15" LJ BU	each	M15-C	2	_____
SMH1501-L	3 1/2 I.D x 9/16 W x 50#/DEG LEFT-HAND TORSION SPRING	each	M21-B	1	_____

11-Mar-03
8:41 AM

SUPERIOR MANUFACTURING

Pick List

BUCDP15052 / BOTTOM PLATE WELDMENT

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1384	1" HALF COUPLING 3000 PSI	each	S3-D	2	_____
BUCDP15053S2	BACKUP INNER PLATE	each		1	_____
BUCDP15053S3	BACKUP OUTER PLATE	each		1	_____
BUCDP9649	PIVOT PIN RETAINER	each		2	_____

11-Mar-03
8:42 AM

SUPERIOR MANUFACTURING

Pick List

BUCDP15053 / TOP PLATE WELDMENT

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1384	1" HALF COUPLING 3000 PSI	each	S3-D	2	_____
BUCDP15053S1	LIFTING LUG	each		4	_____
BUCDP15053S2	BACKUP INNER PLATE	each		1	_____
BUCDP15053S3	BACKUP OUTER PLATE	each		1	_____

11-Mar-03
8:43 AM

SUPERIOR MANUFACTURING

Pick List

BUCDP9640 / HI-PSI CAM SWITCH VALVE ASSY.

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10056	CAM SWITCH MTNG. BRACK F/CLE1075-02 REMOTE TONG	each	M1-B	1	_____
143	HHCS 3/8"-16 X 2 1/4" GR8	each	57	4	_____
213	NYLOCK NUT 3/8"-16 GR8	each	56	4	_____
SLV1000-04	N.C. ORIG.SPOOL VALVE W/VENT NORMALLY CLOSED PICKLIST	each	S3-C	1	_____

11-Mar-03
8:46 AM

SUPERIOR MANUFACTURING

Pick List

BUC57636 / SAFETY CHAIN ASSEMLBY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
73031	1/2" GR.8 CONNECTING LINK CROSBY# 1014722 WL=12000#	each	M9-A	2	_____
BUCDP15054	1/2" CHAIN-9 LINKS	each		1	_____
BUCDP15055	1/2" TWO TON SCREW PIN SHACKLE	each		2	_____

SUPERIOR MANUFACTURING

Pick List

HYTOPS15000 / 15" HYDRAULIC TONG POSITIONER

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00HYTOPS15000	PICKLIST FOR HYTOPS15000 14"TONG 15" BACKUP & SMALLER REV DATE: 11/21/03	each		1	_____
100	NUT 1/4"-20 GR.8	each	55	4	_____
101	LOCKWASHER 1/4" GR8	each	55	4	_____
1024	NUT 3/8"-16	each	50	8	_____
1027	LOCKWASHER 3/8" GR8 (134)	each	50	8	_____
1071	HHCS 3/8"-16 X 3 1/2" GR8	each	51	8	_____
109	HHCS 1/4"-20 X 2" GR8	each	57	2	_____
111	HHCS 1/4"-20 X 2 1/2" GR8	each	57	2	_____
1151	5/8" LOCKWASHER GRADE 8	each	51	16	_____
1157	HHCS 5/8"-11 X 1 1/2" GR8	each	55	16	_____
2070	DUMP VALVE 1 1/4"	each	M2-E	2	_____
58099	HIGH PRESSURE CK.VALVE 1"	each	M7-C	2	_____
CLEBU1664	1/2" FLOW CONTROL VALVE F800S	each		4	_____
CRSS15001	REMOTE CONSOLE BOX F/ HYTOPS15000	each		1	_____
CRSS15009	SHCS METRIC 8 X 125 SS F/ HYTOPS 15000	each		4	_____
CRSS20011	RELIEF CARTRIDGE STERLING P/N: A04G2HZN	each	M18-D	1	_____
CRSS20017	GRESEN- Remote valve P/N: V50-F4-04-NR-C-HRO	each		4	_____
HTS15002	MAIN FRAME ASSEMBLY F/ HYTOPS15000 PICKLIST	each		1	_____
HTS15004	CARRIAGE ASSEMBLY F/ HYTOPS15000 PICKLIST	each		1	_____
HTS15005	SPRING HOUSING ASSEMBLY F/ HYTOPS15000 PICKLIST	each		1	_____
HTS15010	CYLINDER-WT WELD -3" BORE X 16" STR. X 1 3/4" ROD DIA X 3000 PSI	each		2	_____

SUPERIOR MANUFACTURING

Pick List

HYTOPS15000 / 15" HYDRAULIC TONG POSITIONER

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
HTS15012	TOOL, SPRING TENSION, ASSY **HYTOPS™**	each		1	_____
HTS15018	FRONT PIVOT ARM WELDMENT FOR HYTOPS15000 PICKLIST	each		2	_____
HTS15019	LEFT REAR PIVOT ARM WELDMENT FOR HYTOPS15000 PICKLIST	each		1	_____
HTS15020	RIGHT REAR PIVOT ARM WELDMENT FOR HYTOPS15000 PICKLIST	each		1	_____
HTS15025	DANFOSS PILOT OPERATED CHECK VALVE 4K401-N3-SV	each		5	_____
HTS15037	PIVOT PIN SPACERS F/ HYTOPS15000	each		20	_____
HTS15038	LOWER PIVOT CYLINDER PIN F/HYTOPS15000	each	M20-C	2	_____
HTS15039	UPPER PIVOT CYLINDER PIN F/HYTOPS15000	each	M20-C	2	_____
HTS15040	PIVOT CY. BOT. SPACERS F/ HYTOPS15000	each		4	_____
HTS15041	PIVOT CYL.TOP SPACER F/ HYTOPS15000	each		6	_____
HTS15061	SHIFT SIDE MANIFOLD WELDMENT F/ HYTOPS15000 PICKLIST	each		1	_____
HTS15065	BACKUP HANGER ROD F/ HYTOPS15000	each		4	_____
HTS15066	BACKUP HANGER PIN F/ HYTOPS15000	each	M20-C	8	_____
HTS15067	REMOTE VALVE MANIFOLD F/ HYTOPS15000	each		1	_____
HTS15090	REAR HANGER WELDMENTS F/ HYTOPS15000 PICKLIST	each		1	_____
VS4BUB7F-HD	CROSS HEAVY DUTY PILOT OP. DIVERSION VALVE 2500 PSI	each	M19-F	1	_____

SUPERIOR MANUFACTURING

Pick List

HTS15002 / MAIN FRAME ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
CRSS15003	3-pos,closed cent,4-way DO3 Lever op 4600 psi max 23gpm BOSH:0810-091-381	each		4	_____
CRSS15004	(4) BANK DO3 ALUM. MANIFOLD DAMAN: A-DO3-P04-02-S/C	each	M18-D	1	_____
CRSS15008	SHCS METRIC 10-24 X 1 1/2"SS F/ HYTOPS15000	each		16	_____
CRSS20011	RELIEF CARTRIDGE STERLING P/N: A04G2HZN	each	M18-D	1	_____
CRSS20039	Long DO3 valve handles Note: shorten original by 1"	each	M18-D	2	_____
CRSS20040	Short DO3 valve handles Note: shorten original by 2"	each	M18-D	2	_____
HTS15001	MAIN FRAME WELDMENT F/ HYTOPS15000 PICKLIST	each		1	_____
HTS15009	DO3 VALVE HANDLE EXTENSION F/ HYTOPS15000	each	M19-A	4	_____
HTS15023	REAR LARGER MAGNETS LM-6000	each		2	_____
HTS15024	FRONT SMALLER MAGNETS LM-3000	each		2	_____
HTS15050	FOOT CYLINDERS lynair- H-3 1/4CO8-7-2-P2 F/ HYTOPS15000	each		4	_____
HTS15051	ROD COUPLER lynair- LC-1-28 MODIFIED F/ HYTOPS15000	each		4	_____
HTS15052	MAGNET ALLTHREAD ROD FOR HYTOPS15000	each		2	_____
HTS15053	RISER CYLINDER ASSEMBLY F/ HYTOPS15000 PICKLIST	each		1	_____
HTS15098	MAGNET SPACER F/HYTOPS15000	each		2	_____
HTS15099	MAGNET ROD F/HYTOPS15000	each	M19-A	2	_____

SUPERIOR MANUFACTURING

Pick List

HTS15004 / CARRIAGE ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
HTS15003	CARRIAGE WELDMENT F/ HYTOPS15000 PICKLIST	each		1	_____
HTS15010	CYLINDER-WT WELD -3" BORE X 16" STR. X 1 3/4" ROD DIA X 3000PSI	each		2	_____
HTS15015	M16 x 2 3/8 LONG METRIC BOLT GR. 8.8 = 125 KSI TENSILE F/ HYTOPS15000	each		16	_____
HTS15016	AXIAL BEARING Pacific Bearing-#984-063-AP6 F/ HYTOPS15000	each	WALL17	4	_____
HTS15029	CHAIN ANCHOR-132-109	each		2	_____

SUPERIOR MANUFACTURING

Pick List

HTS15005 / SPRING HOUSING ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1001	ZERT 1/8" NPT	each	50	4	_____
1046	HHCS 3/8"-16 X 3/4" GR8	each	50	8	_____
1210	NUT 1"-8 GR8	each	52	8	_____
194	NUT 5/8"-11 GR8	each	57	8	_____
58059-S1	DOOR ROLLER BUSHING 12DU16 F/ CLJ 5500	each	S2-F	4	_____
BUCS2165	SMALL BRONSE BUSHED SHEAVE 3x3/8 wire x 3/4 shaft (STK# 460147)	each		4	_____
BUCS2168	SMALL SHEAVE SPACER F/SUSPENSION SYSTEM CRSS20000	each	M13-F	8	_____
BUCS2197	SMALL SHEAVE PIN F/SUSPENSION SYSTEM CRSS20000	each	M14-A	4	_____
BUCS4023	FLATWASHER 1"	each	M14-C	4	_____
HTS15006	SPRING HOUSING WELDMENT F/ HYTOPS15000 PICKLIST	each		1	_____
HTS15007	SPRING ADJUSTMENT ASSEMBLY F/ HYTOPS15000 PICKLIST	each		4	_____
HTS15008	MOTOR PROTECTOR PLATE F/ HYTOPS15000	each		1	_____
HTS15026	TOP HANGER SPRING 1/2 W x 4 O.D x 40 L x 60#/"	each		4	_____
HTS15095	SMALL SPRING PLUNGER F/ HYTOPS15000	each		4	_____
HTS76040	FRONT INNER SPRING 2.875 OD x .3125 WIRE x 31" 20lbf/in - C&G	each		2	_____
X2-76	HHCS 5/8"-11 X 6" GR8	each	S9-B	8	_____

ACCESSORIES AND OPTIONS

Several different accessory items are available for the **CLINCHER®** Tong and Backup to allow them to be customized to provide a system most appropriate for the inducer's application.

CLE14000DP01 Tong Accessories

Compression Load Cell and Torque Gauge	directly measures applied torque
Tension Load Cell and Torque Gauge	directly measures applied torque
Solenoid Operated Module for Dump Valve	allows computer to limit torque applied
Adapter for Turns Proximity Switch	allows computer to sense rotation
3 Point Lifting Bridle	alternative lifting system
Lift Cylinder with Integral Spring Hanger	controls vertical position
TSP-80 Tong Speed Control	allows slow speed rotation with full torque
2 Speed Motors	
Alternate Motor Displacements	
Remotely Operated Tong Door	Operator can open/close door w/o leaving control station or need for support personnel

BUCDP15000 Backup Accessories

Backup Handles	simplifies manipulation
Shipping Skids and Cages	simplify handling, transport and help guard against damage

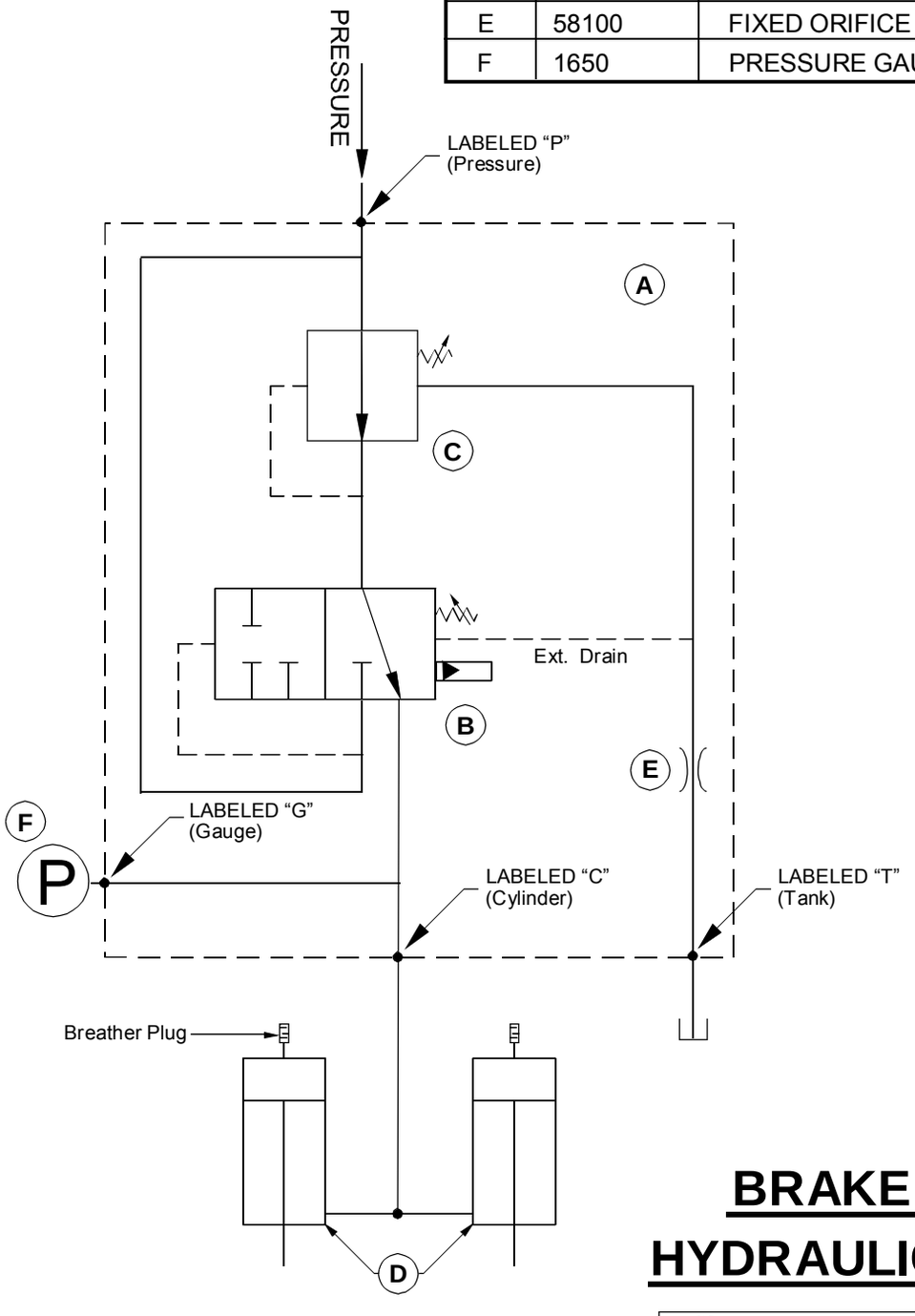
ACCESSORIES AND OPTIONS

Hydraulically Operated Cage Plate Brake System

This system replaces the springs used to energize the cage plate brake band. When the tong motor is activated, hydraulic pressure is directed through a pressure reducing valve (ref Item B, Dwg. No. Ill1080) set at 250 to 300 psi. This low pressure fluid is then directed through a directional control valve system (ref Item A) and on to a pair of hydraulic cylinders (ref Item C) connected to the brake band. This pressure creates the brake band resistance required to cause the relative rotation between the cage plate assembly and the ring gear required to activate the jaws. At high torques when the motor pressure exceeds approximately 2000 psi the directional control valve shifts to shut off hydraulic fluid into the brake cylinder. Pressure contained within the cylinders is allowed to bleed off through a fixed orifice (ref Item D) to a level equivalent to system back pressure. Relieving this pressure reduces brake friction at a time when it is not required because the jaws have already been actuated, thus increasing overall tong efficiency.

If brake performance appears to be less than required, pressure can be increased by adjusting the regulator stem on the pressure reducing valve (Item B). We do not recommend that brake system pressure be allowed to exceed 500 psi as shown on pressure gauge (Item E) attached to the directional control valve.

ITEM	PART NO.	DESCRIPTION
A	58090	CUSTOM MANIFOLD, C-22102
B	58090-S1	CARTRIDGE, DPBMLBN
C	58090-S2	CARTRIDGE, 1PA10-F3-10SV
D	72032	BRAKE CYLINDERS (2 required)
E	58100	FIXED ORIFICE
F	1650	PRESSURE GAUGE (0-3000 PSI)



BRAKE CYLINDER HYDRAULIC SCHEMATIC

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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REV. #	LOG #	DATE
3		10/07/02

REF: S:\Equip Manuals\Dwgs\ILL1080 rev3.wpg

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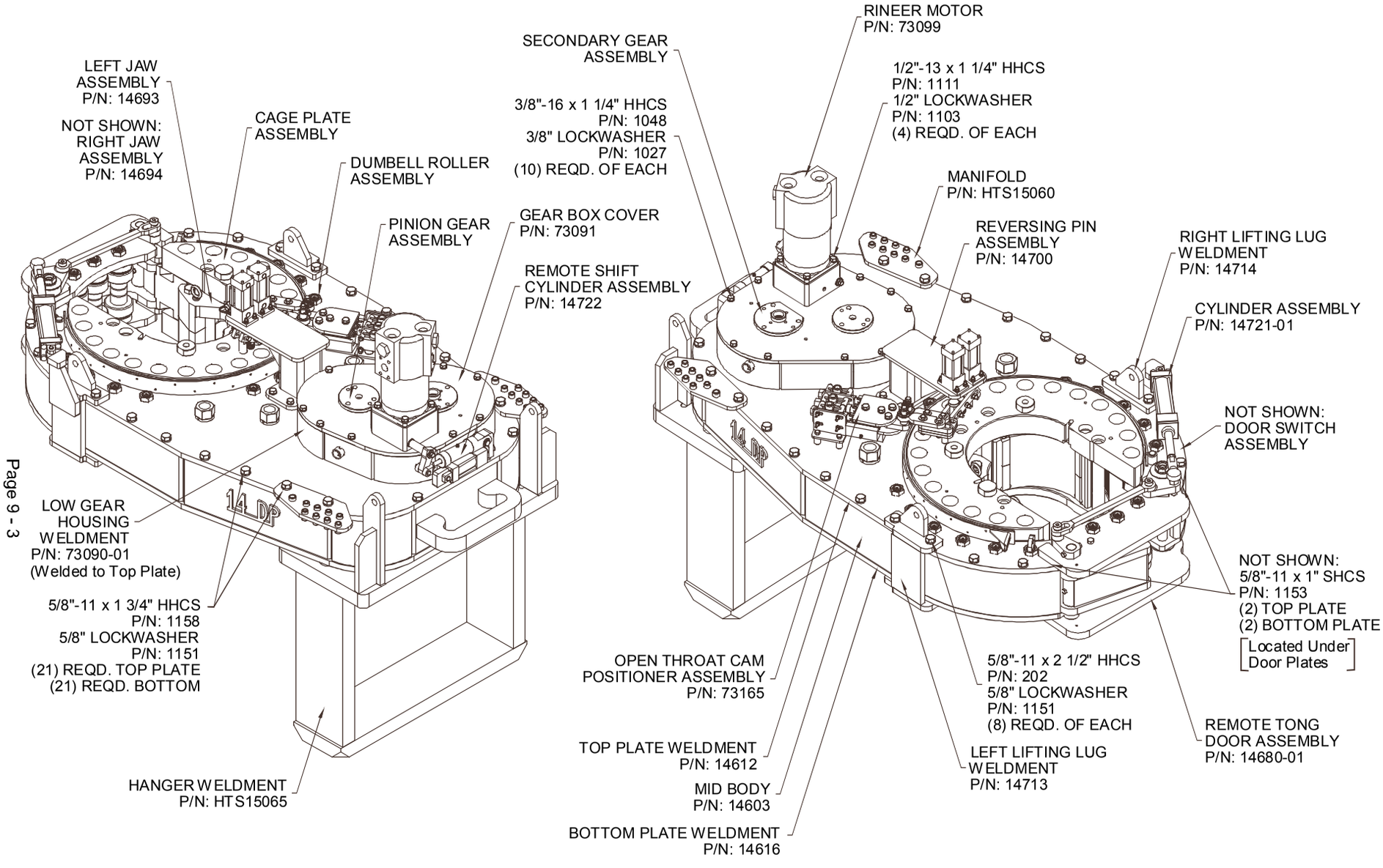
LEFT JAW ASSEMBLY P/N: 14693
NOT SHOWN: RIGHT JAW ASSEMBLY P/N: 14694
CAGE PLATE ASSEMBLY
DUMBELL ROLLER ASSEMBLY
PINION GEAR ASSEMBLY
GEAR BOX COVER P/N: 73091
REMOTE SHIFT CYLINDER ASSEMBLY P/N: 14722
LOW GEAR HOUSING WELDMENT P/N: 73090-01 (Welded to Top Plate)
5/8"-11 x 1 3/4" HHCS P/N: 1158
5/8" LOCKWASHER P/N: 1151
(21) REQD. TOP PLATE
(21) REQD. BOTTOM
HANGER WELDMENT P/N: HTS15065
SECONDARY GEAR ASSEMBLY
3/8"-16 x 1 1/4" HHCS P/N: 1048
3/8" LOCKWASHER P/N: 1027
(10) REQD. OF EACH
RINEER MOTOR P/N: 73099
1/2"-13 x 1 1/4" HHCS P/N: 1111
1/2" LOCKWASHER P/N: 1103
(4) REQD. OF EACH
MANIFOLD P/N: HTS15060
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RIGHT LIFTING LUG WELDMENT P/N: 14714
CYLINDER ASSEMBLY P/N: 14721-01
NOT SHOWN: DOOR SWITCH ASSEMBLY
NOT SHOWN: 5/8"-11 x 1" SHCS P/N: 1153
(2) TOP PLATE
(2) BOTTOM PLATE
[Located Under Door Plates]
OPEN THROAT CAM POSITIONER ASSEMBLY P/N: 73165
5/8"-11 x 2 1/2" HHCS P/N: 202
5/8" LOCKWASHER P/N: 1151
(8) REQD. OF EACH
REMOTE TONG DOOR ASSEMBLY P/N: 14680-01
TOP PLATE WELDMENT P/N: 14612
LEFT LIFTING LUG WELDMENT P/N: 14713
MID BODY P/N: 14603
BOTTOM PLATE WELDMENT P/N: 14616

14" DRILL PIPE COMBO TONG ASSEMBLY

FOR HYTOPS

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REV. #	LOG #	DATE
		04/10/03

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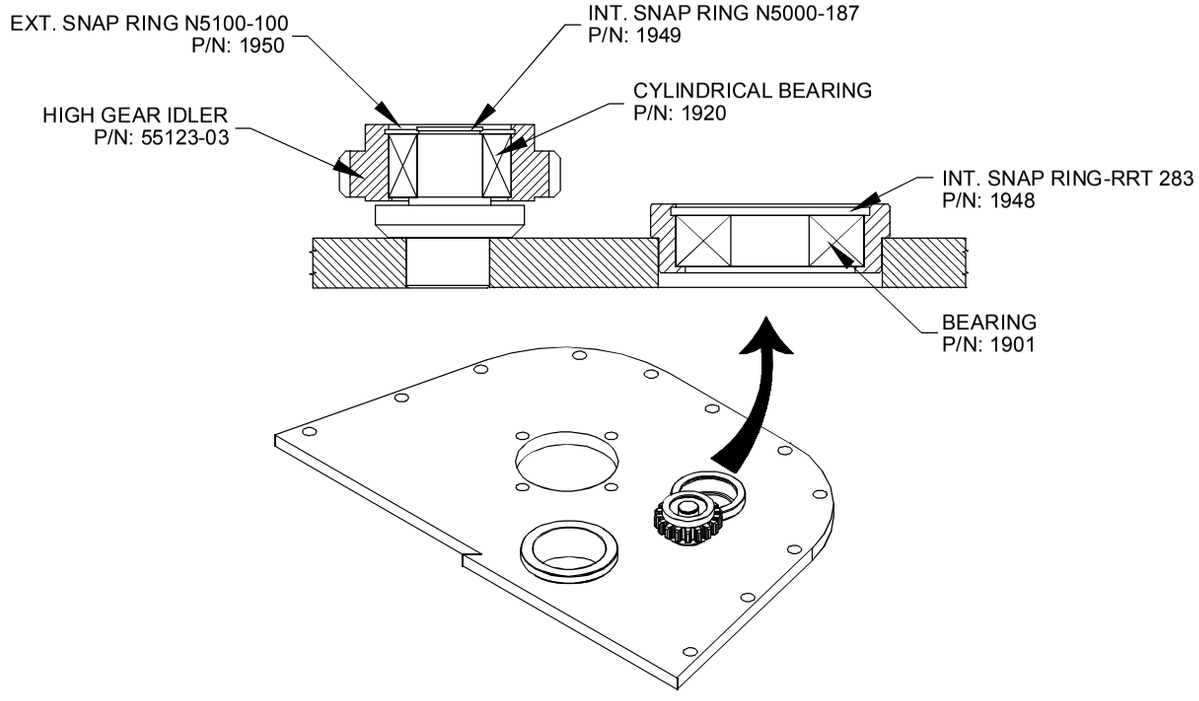

TOP PLATE ASSEMBLY

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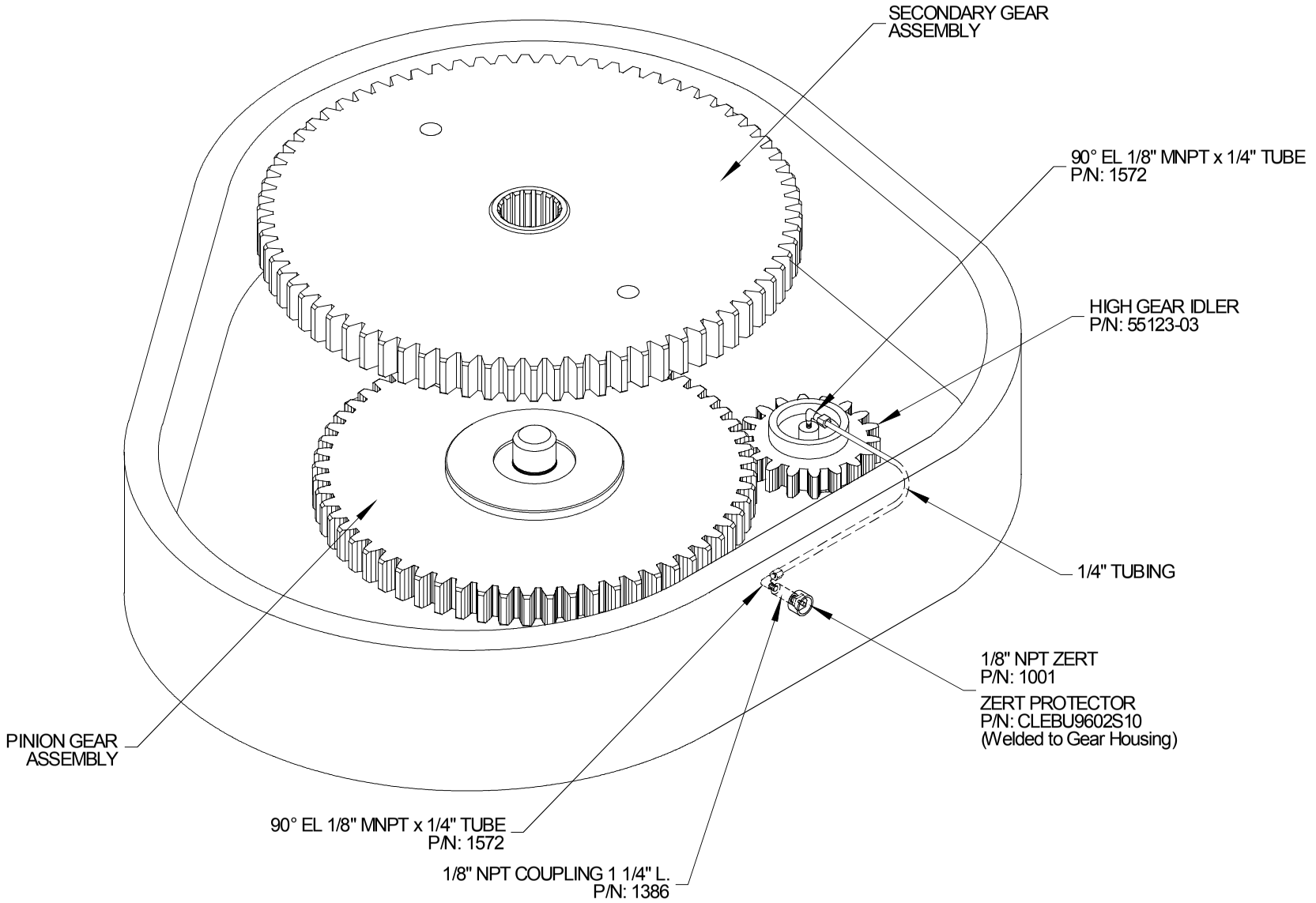
		02/13/03
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\CLE14000DP\Top Plate.wpg


SECONDARY GEAR ASSEMBLY
90° EL 1/8" MNPT x 1/4" TUBE P/N: 1572
HIGH GEAR IDLER P/N: 55123-03
1/4" TUBING
1/8" NPT ZERT P/N: 1001
ZERT PROTECTOR P/N: CLEBU9602S10 (Welded to Gear Housing)
PINION GEAR ASSEMBLY
90° EL 1/8" MNPT x 1/4" TUBE P/N: 1572
1/8" NPT COUPLING 1 1/4" L. P/N: 1386

GEAR BOX HOUSING

TONG MODEL CLE8625DP-05

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REV. #	LOG #	02/05/02 DATE

REF: S:\Equip Manuals-Dwgs\CLE8625DP\Gear Housing.wpg

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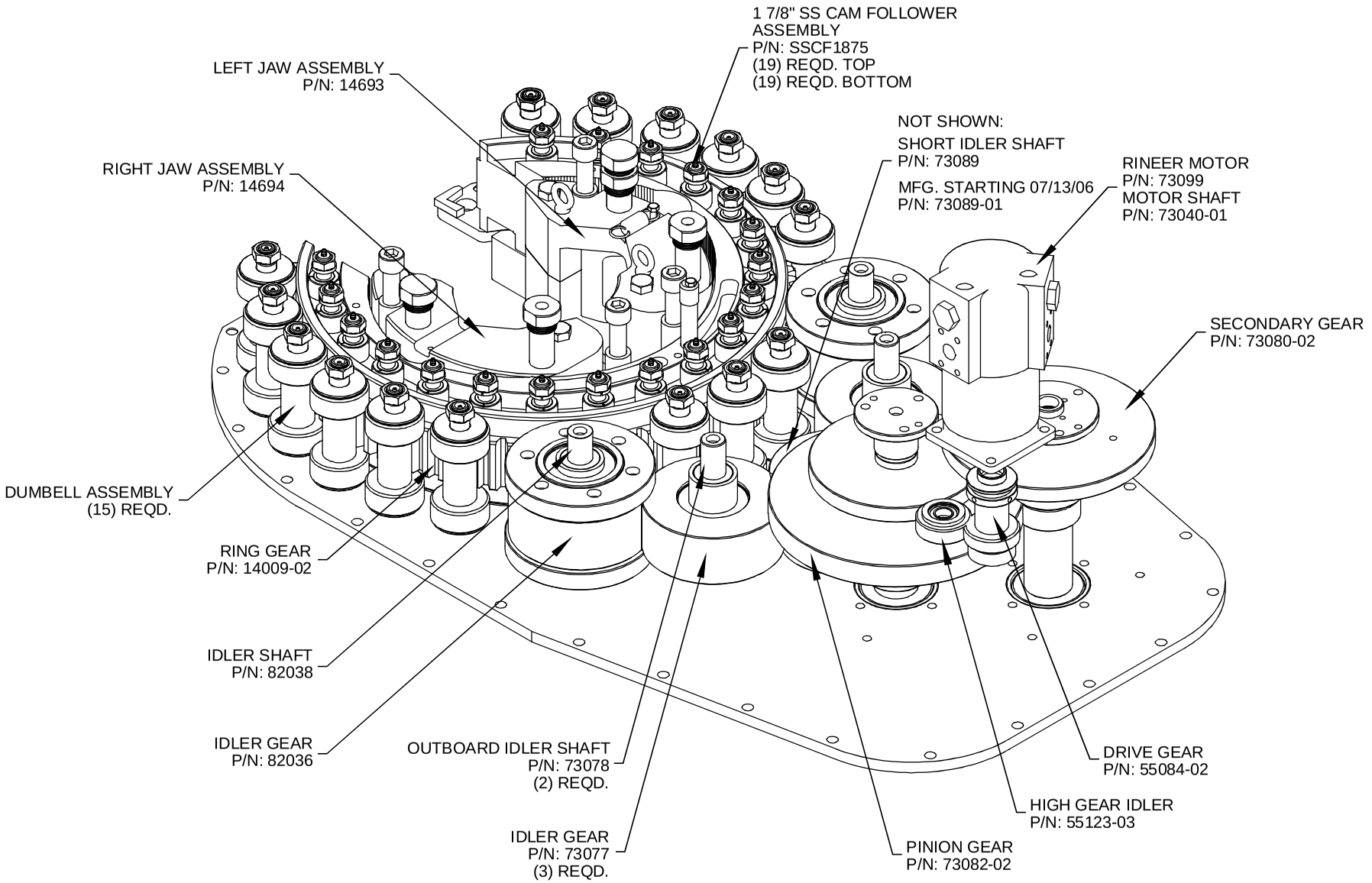

GEAR TRAIN ASSEMBLY

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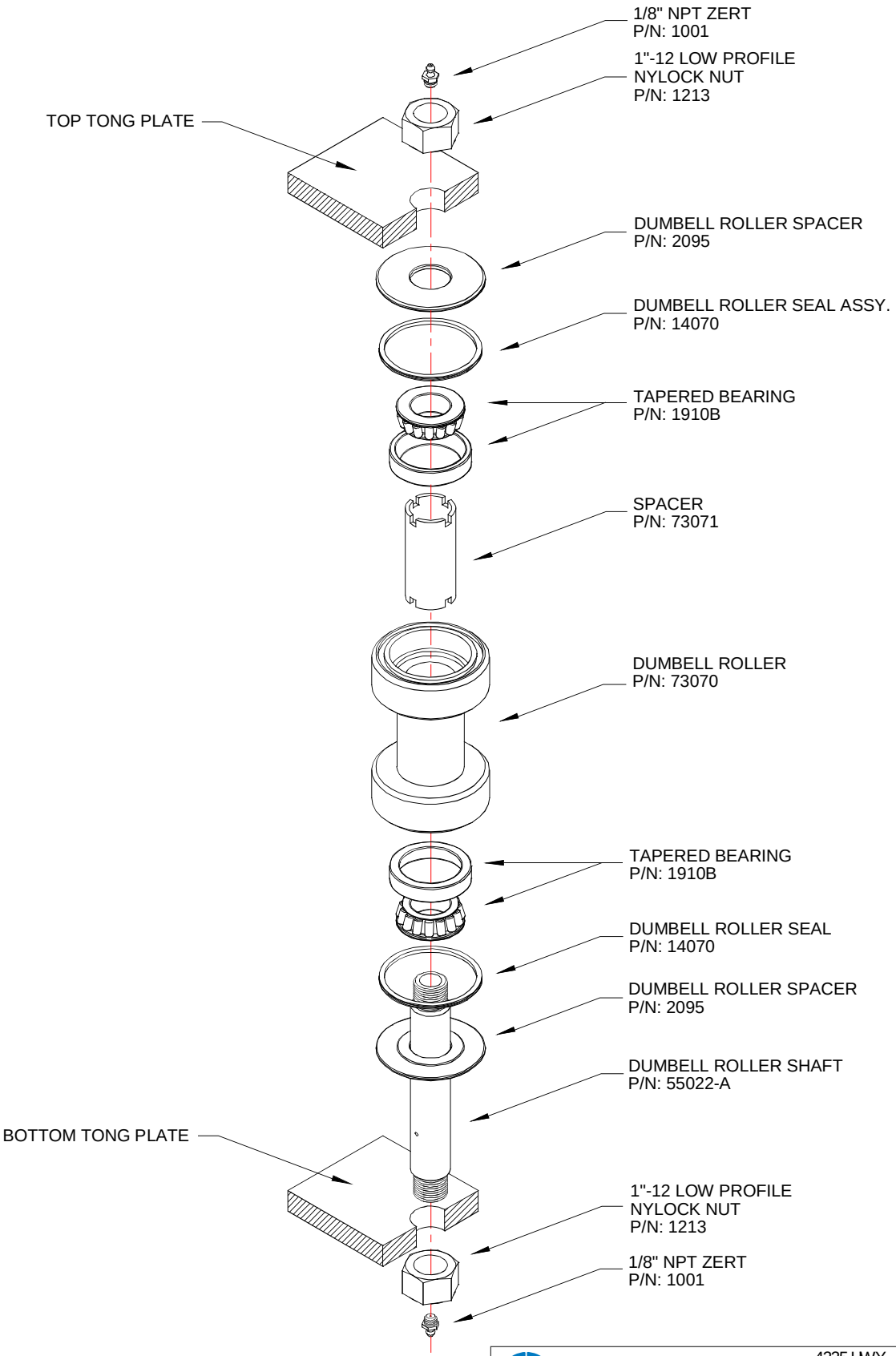
REV. #	LOG #	DATE
1		05/15/07

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000DP01\Gear Train rev1.wpg



DUMBELL ROLLER ASSEMBLY

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REV. #	LOG #	DATE
1		02/13/03

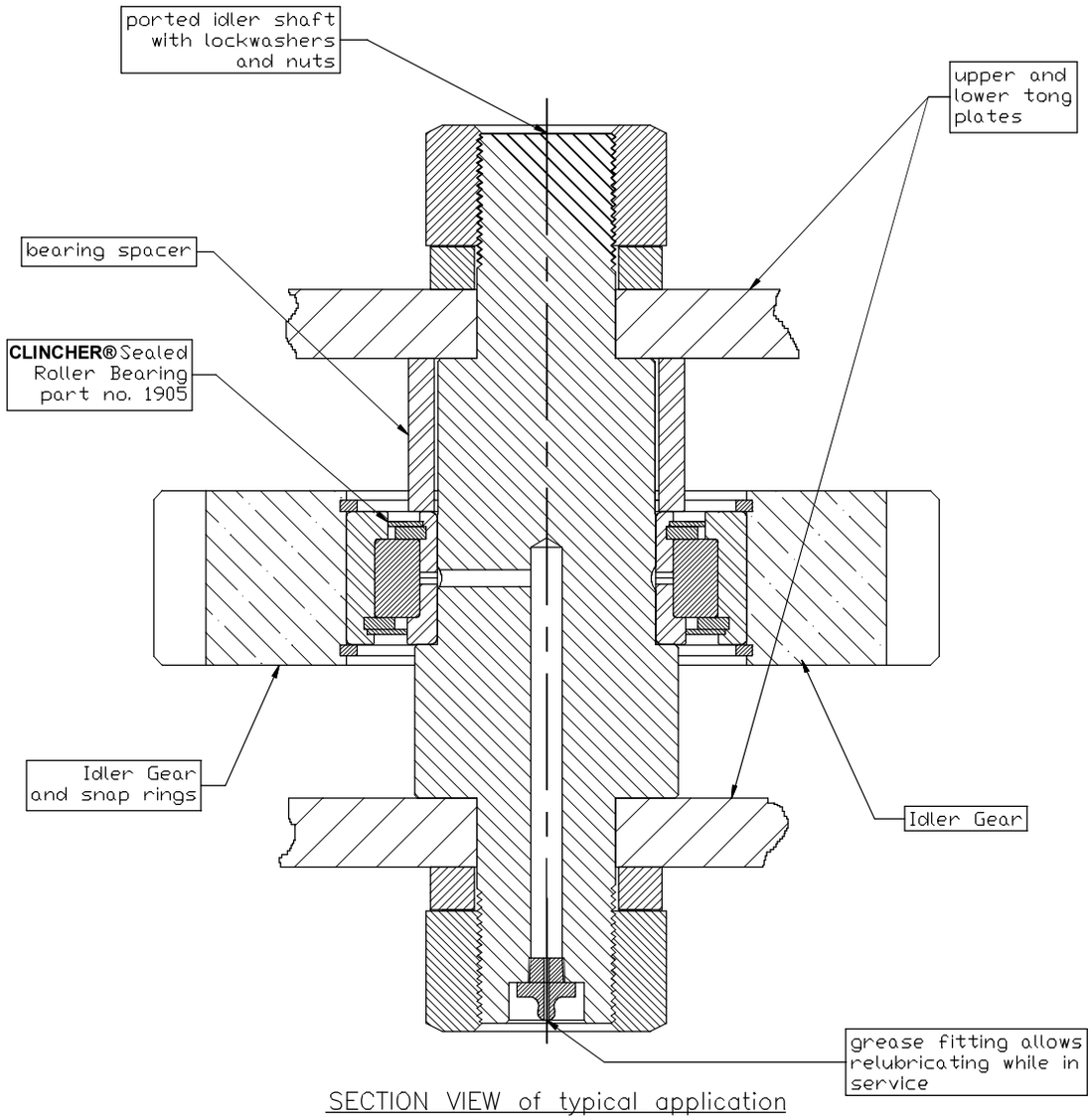
REF: P:\Manuals\Equip Manuals\Dwgs\CLE8625DP\Dumbell Roller rev1.wpg

Features and Benefits:
Proprietary sealed bearing with full compliment roller design offers greater load ratings than commercially available sealed ball bearings. The ported inner race allows the bearing to be relubricated without disassembly. Integral elastomeric seals allow grease to be displaced but prevent migration of contaiminants into bearing.

Elastomeric seals are corrosion resistant and suitable for use in environments which are incompatible with traditional aluminum bearing shrouds.

Unique geometric design allows rollers to absorb thrust loads to maximize component life.

Nominal OD: 4.3307 inches
Nominal ID: 2.3622 inches
Nominal Ht: 1.4375 inches
static rating: 37540 lbs
dynaminc rating: 29230 lbs
(1mm cycles, 33 1/3 RPM f/ 500 hrs.)


ported idler shaft with lockwashers and nuts
upper and lower tong plates
bearing spacer
CLINCHER® Sealed Roller Bearing part no. 1905
Idler Gear and snap rings
Idler Gear
grease fitting allows relubricating while in service

SECTION VIEW of typical application

Rev.#	By	Log#	Description of Revision
3			
2			
1	DB	12/07/02	added desc of thrust load capability

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE — R3

2 PLACE DEC. ±.020	3 PLACE DEC. ±.005	FRACTIONS ± 1/16	ANGLES ± .5°	SURFACE 250	FLATNESS AR PL. ± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

△1 or ⬡1 = Revision Number
1.000 = Critical Dimension 100% Inspection Required

SHEET 1 of 2

SUPERIOR Manufacturing & Hydraulics
4225 HWY.90 E
BROUSSARD,LA 70518
(318)837-8847

PART NAME: SEALED IDLER BEARING

PART #: 1905
DRAWN BY:
APPROVED BY:
CHK BY: DATE:
REF: ILL1000/ILL1142.DWG

MATERIAL SPECIFICATION
Matl.Req:
Initial Condition:
Alternative Matl:
H.T Instructions: Case Depth: C.D

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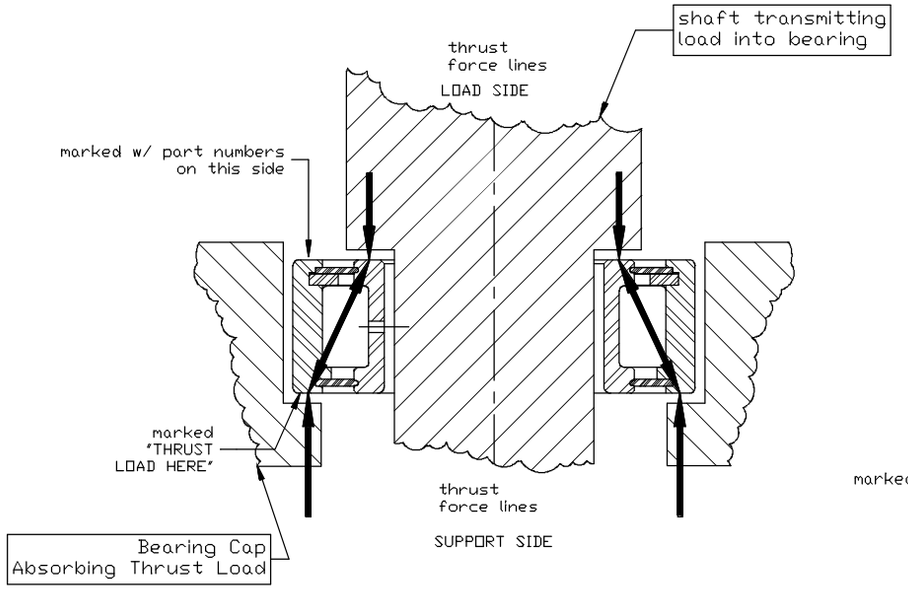
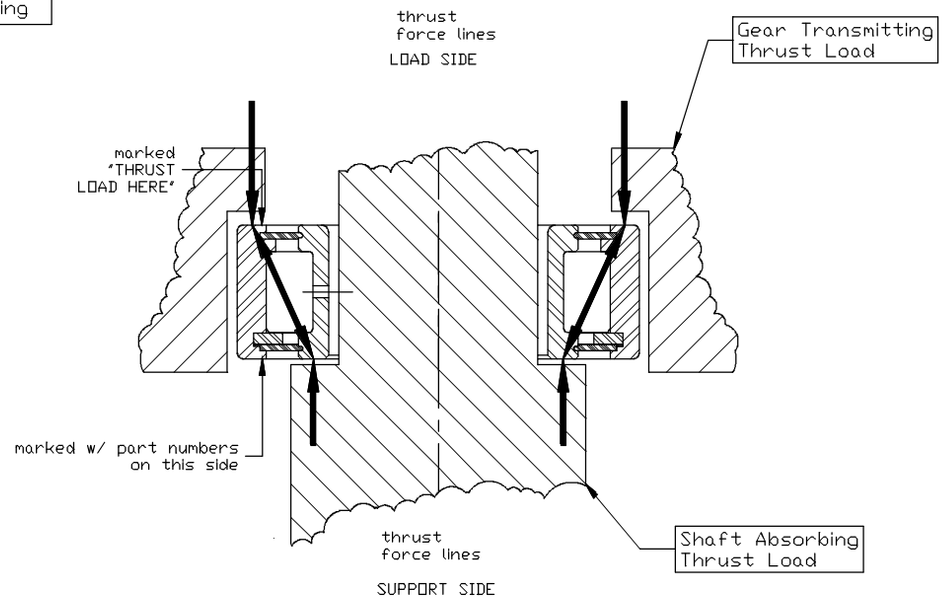


Bottom Bearing Cap Application



Gear Support Application

Installation instructions for **CLINCHER®** BEARING Part Number 1905

Rev.#	By	Log#	Description of Revision
3			
2			
1	DB	12/07/02	added desc of thrust load capability

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UNLESS OTHERWISE SPECIFIED TOLERANCES ARE — R3

2 PLACE DEC. ±.020	3 PLACE DEC. ±.005	FRACTIONS ± 1/16	ANGLES ± .5°	SURFACE 250	FLATNESS AR PL. ± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

△1 or ⬡1 = Revision Number

1.000 = Critical Dimension 100% Inspection Required

SHEET 2 of 2

SUPERIOR Manufacturing & Hydraulics
4225 HWY.90 E
BROUSSARD,LA 70518
(318)837-8847

PART NAME: Installation instructions for P/N 1905 SEALED IDLER BEARING

PART #: 1905 | MATERIAL SPECIFICATION

DRAWN BY:

APPROVED BY:

CHK BY: DATE:

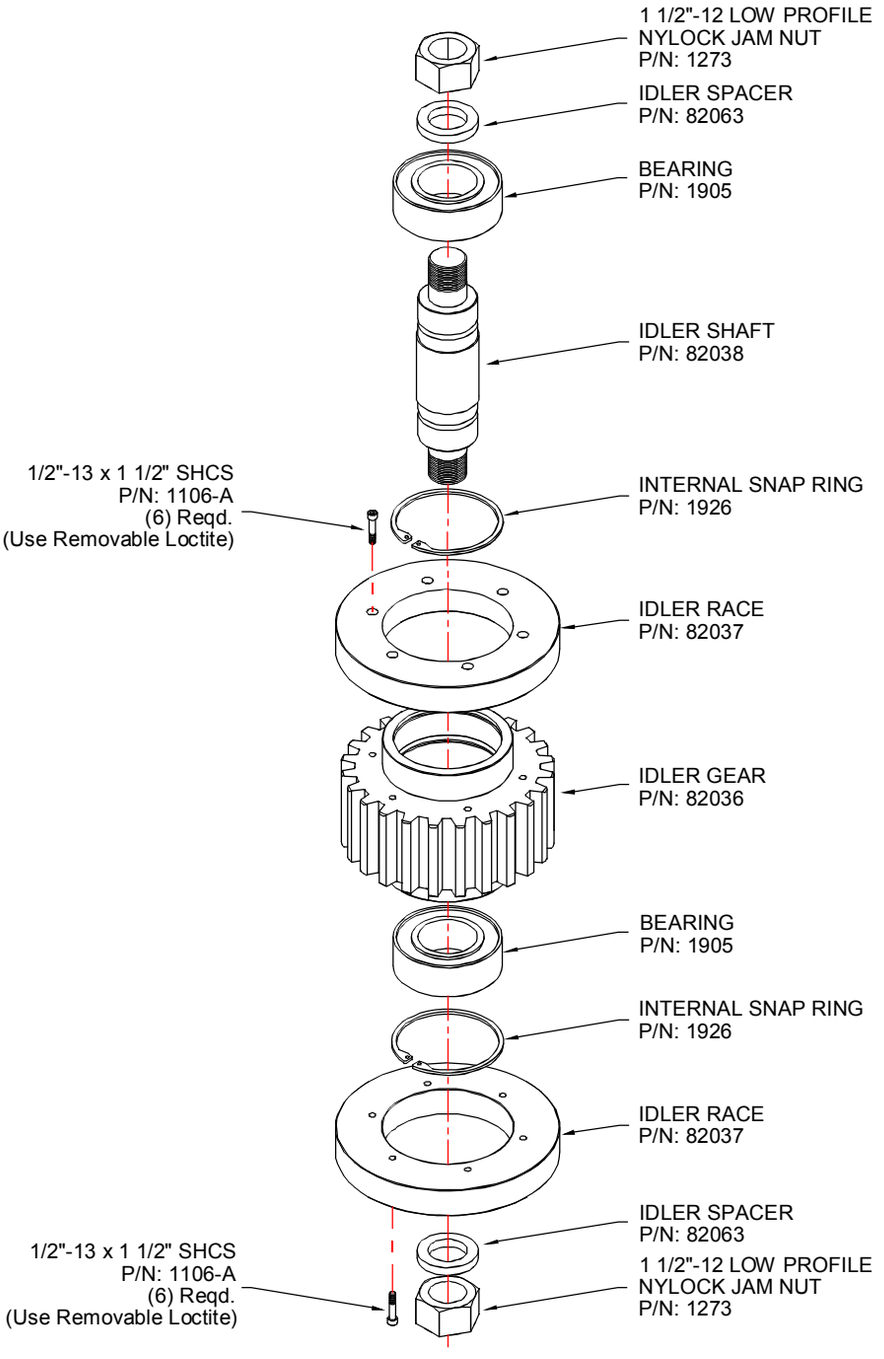
REF: REF ILL1000/ILL1142.DWG

Matl.Req:

Initial Condition:

Alternative Matl:

H.T Instructions: Case Depth: C.D



IDLER GEAR ASSEMBLY

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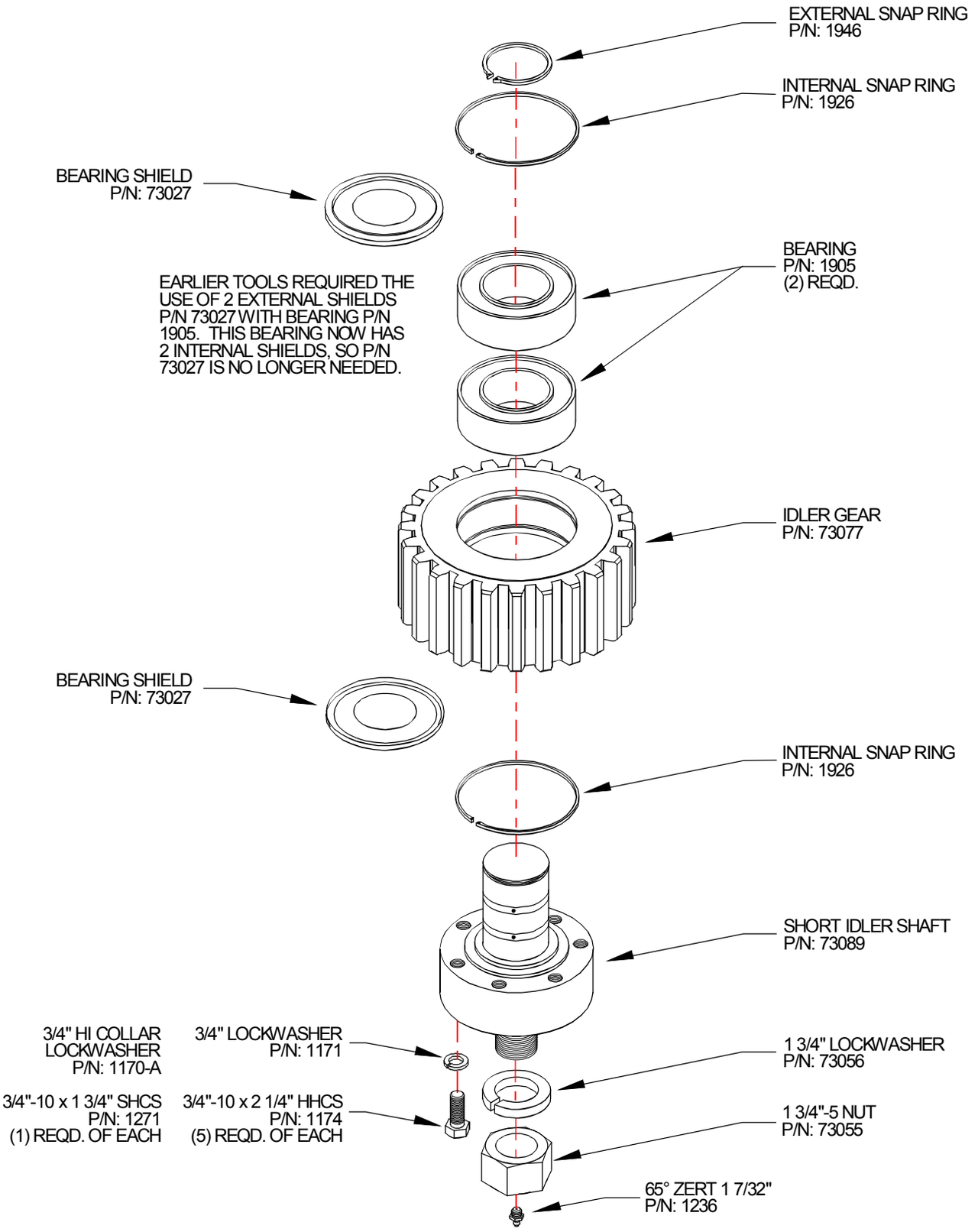
		02/17/03
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\CLE14000DP\Idler.wpg



IDLER GEAR ASSEMBLY WITH SHORT SHAFT

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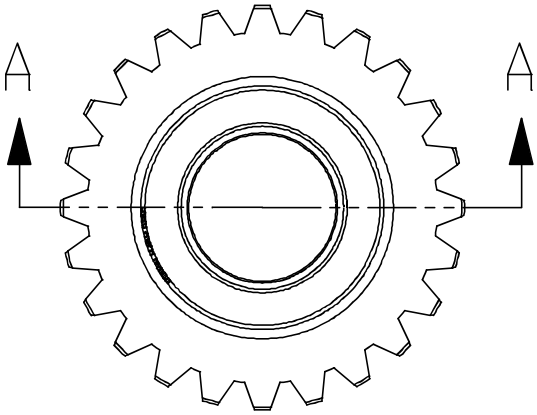
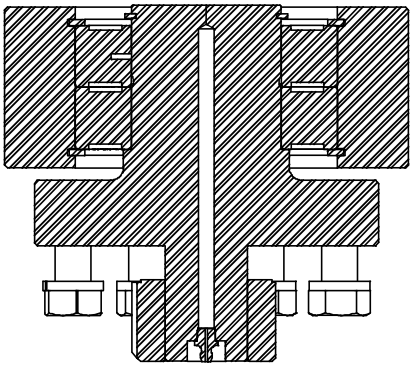
		02/17/03
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\CLE14000DP\Idler Short Shaft.wpg

Item #	Qty.	Part Number	Part Name
1	1	73055	HEX NUT 1 3/4"-5 GR8
2	1	73089-01	SHORT IDLER SHAFT
3	1	1001	1/8 NPT ZERT
4	7	1171	3/4" LOCKWASHER
5	7	1174	3/4"-10 X 2 1/4" HHCS
6	1	73077-01	IDLER GEAR
7	2	1987	INTERNAL SPIROLOX RETAINING RING
8	2	1991	BEARING
9	1	1944	EXTERNAL SPIROLOX RETAINING RING





SECTION A-A
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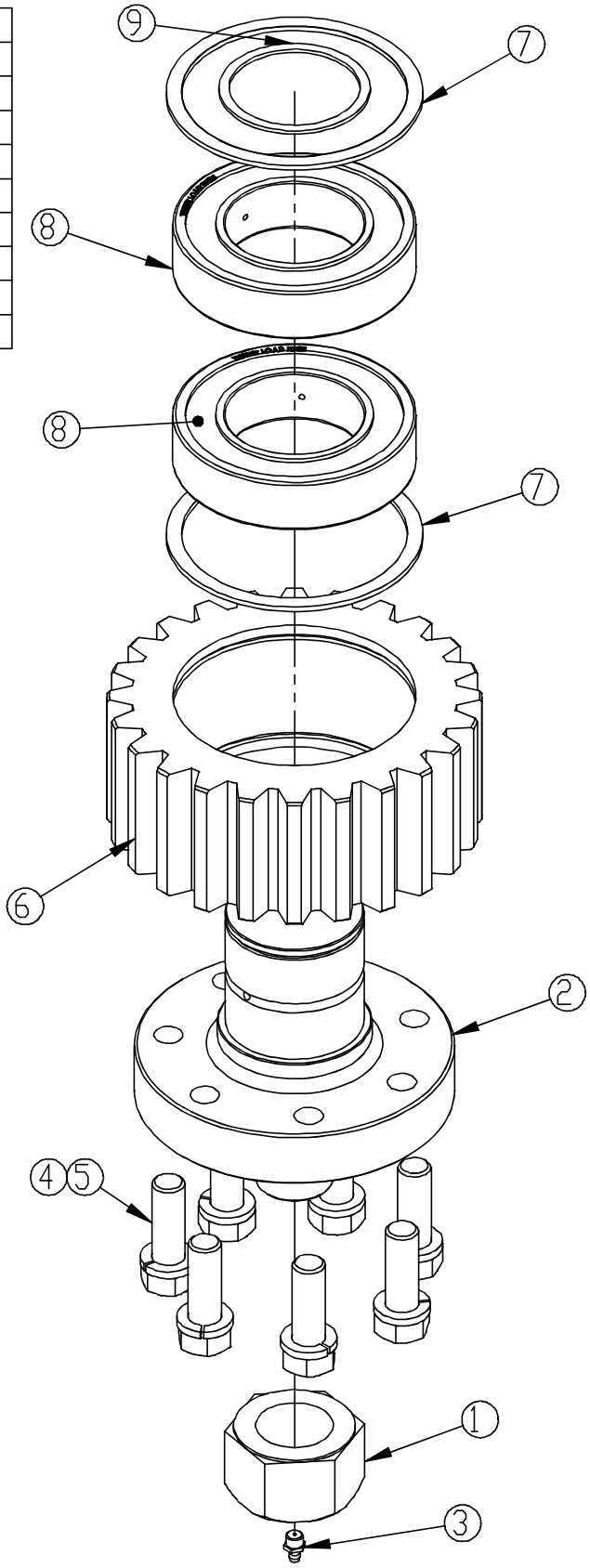

MANUFACTURE STARTING 07/13/06

IDLER GEAR ASSEMBLY WITH SHORT SHAFT

ASSEMBLY NO. 14740-01

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		07/17/06
REV. #	LOG #	DATE

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000DP\14740-01 Idler.wpg

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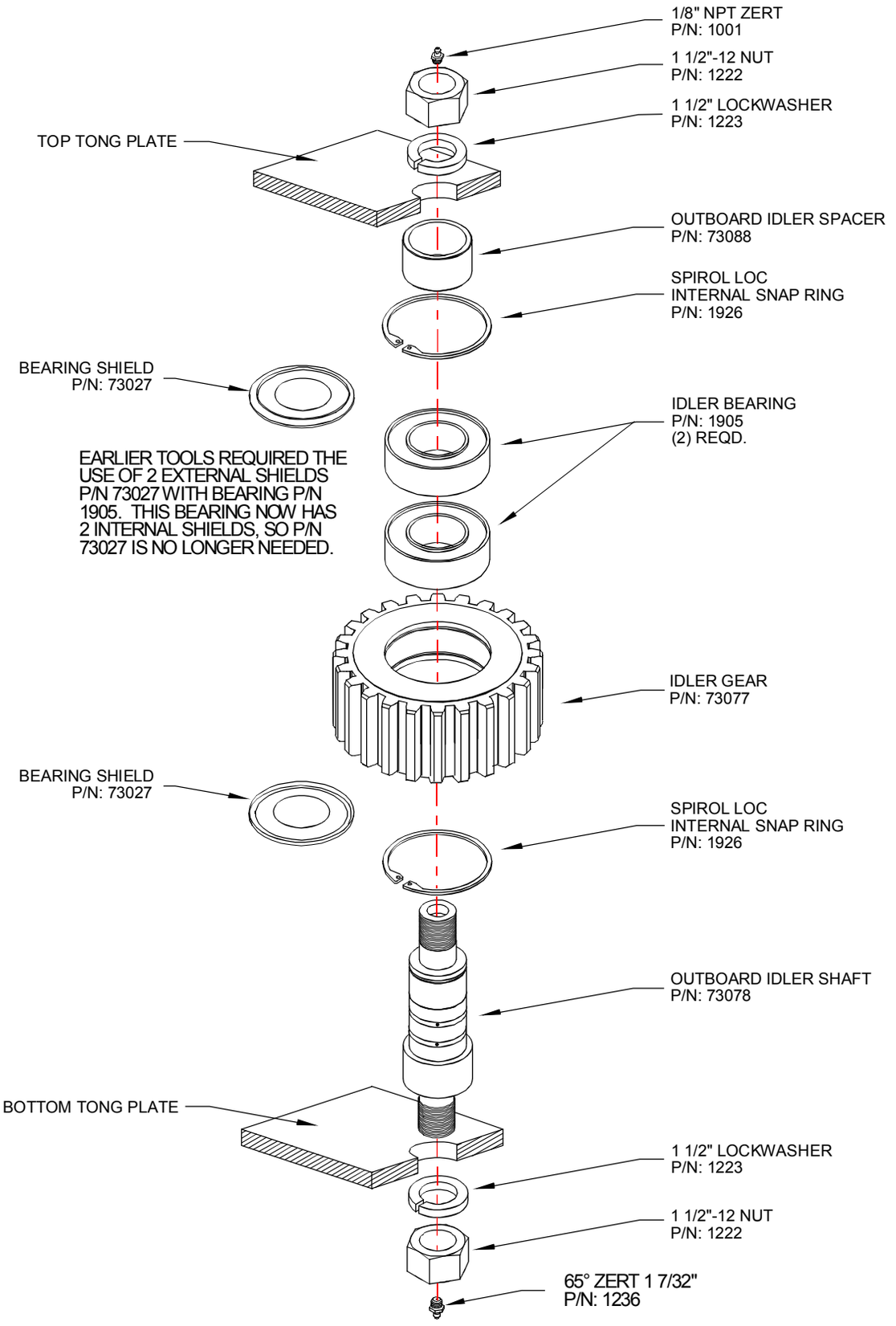

OUTBOARD IDLER GEAR ASSEMBLY

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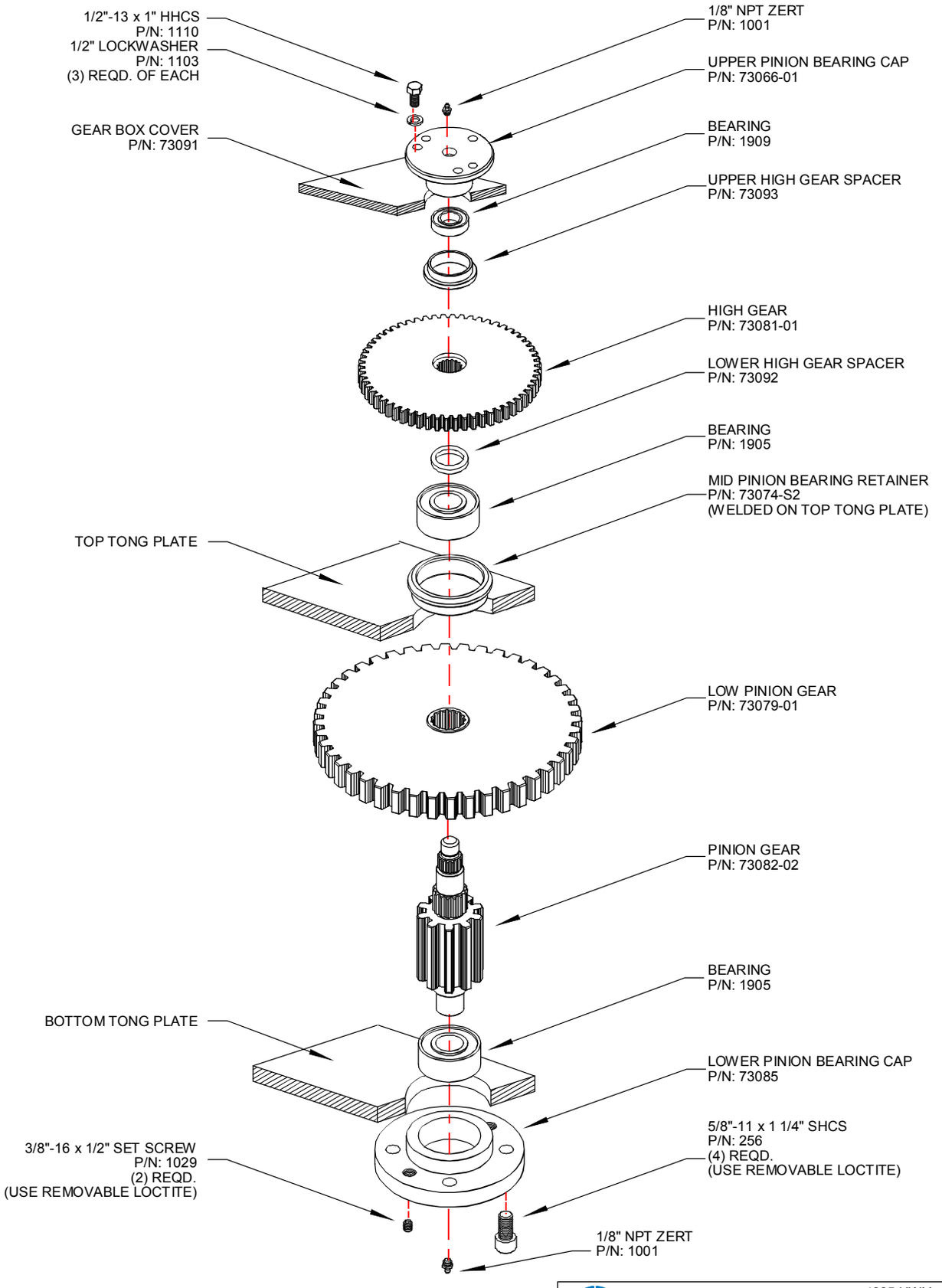
REV. #	LOG #	DATE
		02/17/03

REF: S:\Equip Manuals-Dwgs\CLE14000DP\Idler Outboard.wpg



PINION GEAR ASSEMBLY

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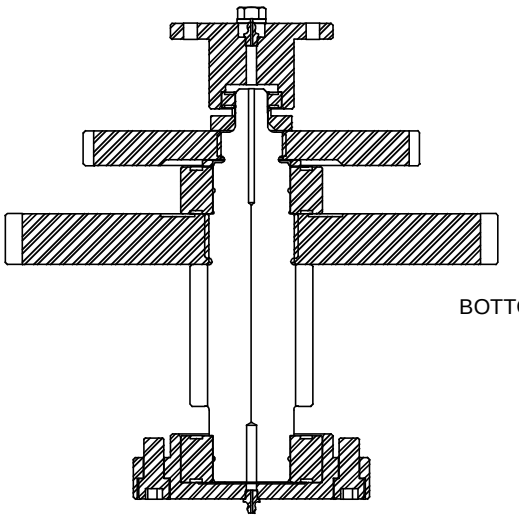
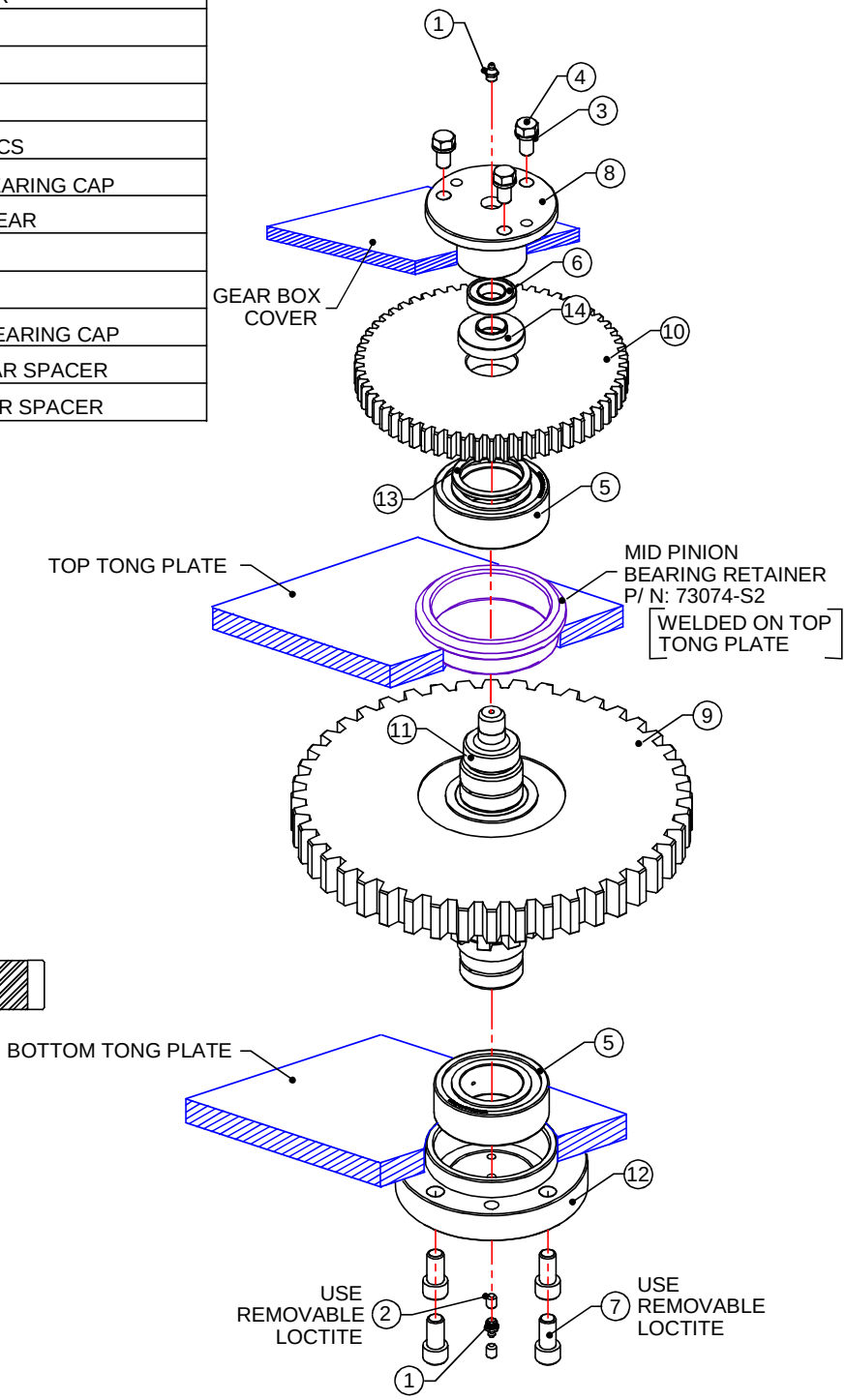
		02/17/03
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\CLE14000DP\Pinion Gear.wpg

Item #	Qty.	Part Number	Part Name
1	2	1001	1/8" NPT ZERT
2	2	1029	3/8"-16 x 1/2" SET SCREW
3	3	1103	1/2" LOCKWASHER
4	3	1110	1/2"-13 x 1" HHCS
5	2	1905	BEARING
6	1	1909	BEARING
7	4	256	5/8"-11 x 1 1/4" SHCS
8	1	73066-01	UPPER PINION BEARING CAP
9	1	73079-01	LOWER PINION GEAR
10	1	73081-01	HIGH GEAR
11	1	73082-03	PINION GEAR
12	1	73085	LOWER PINION BEARING CAP
13	1	73092	LOWER HIGH GEAR SPACER
14	1	73093	UPPER HIGH GEAR SPACER



SECTION A - A



PINION GEAR ASSEMBLY

ASSEMBLY NO. 26068-01
FOR CLE14000DP03
MANUFACTURE BEGINNING 07/2007
FOR ALL MODELS
MANUFACTURE BEGINNING 02/2008

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REV. #	LOG #	DATE
1		02/14/08

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000DP03\26068-01 Pinion rev1.wpg

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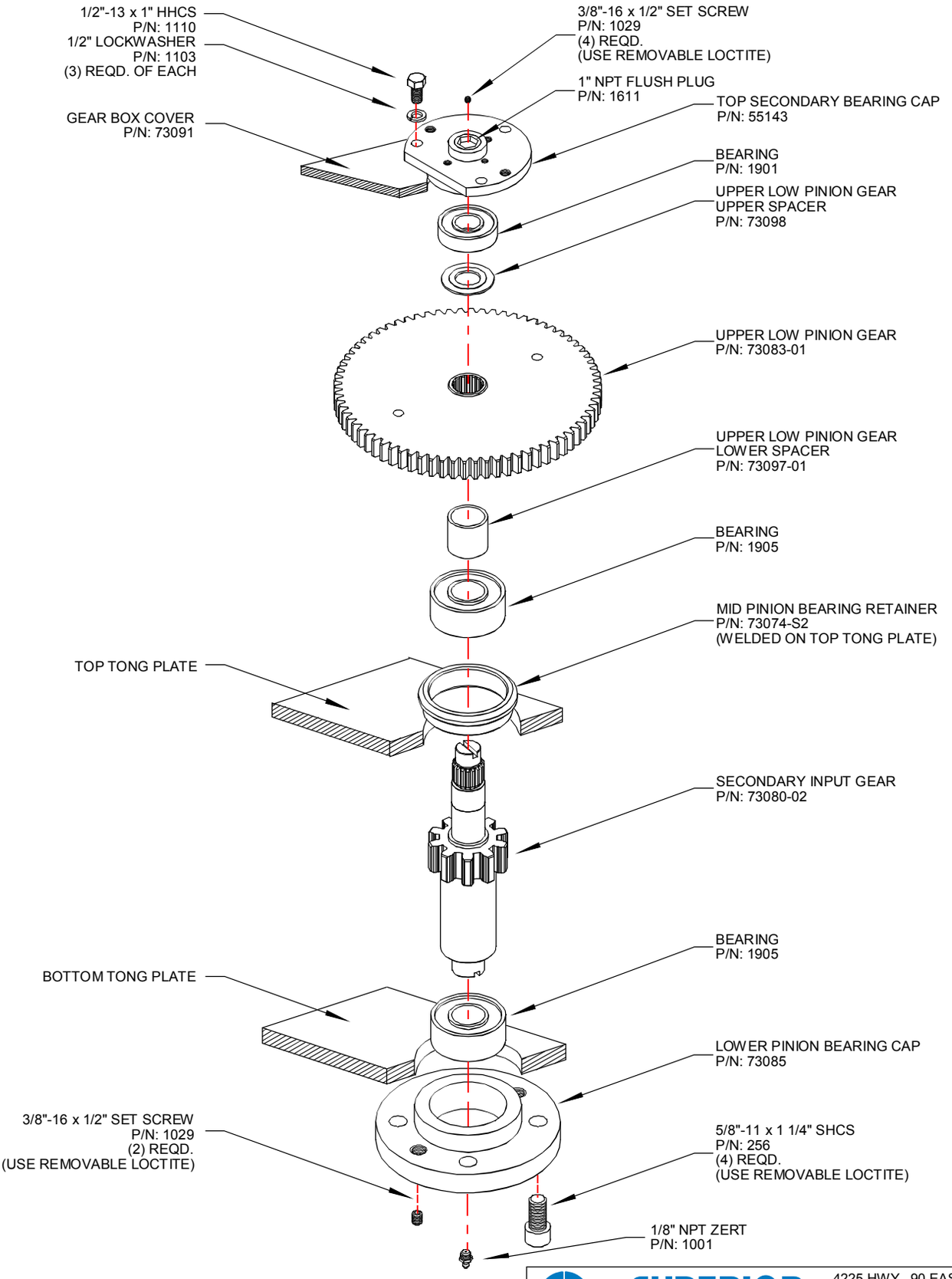

SECONDARY GEAR ASSEMBLY

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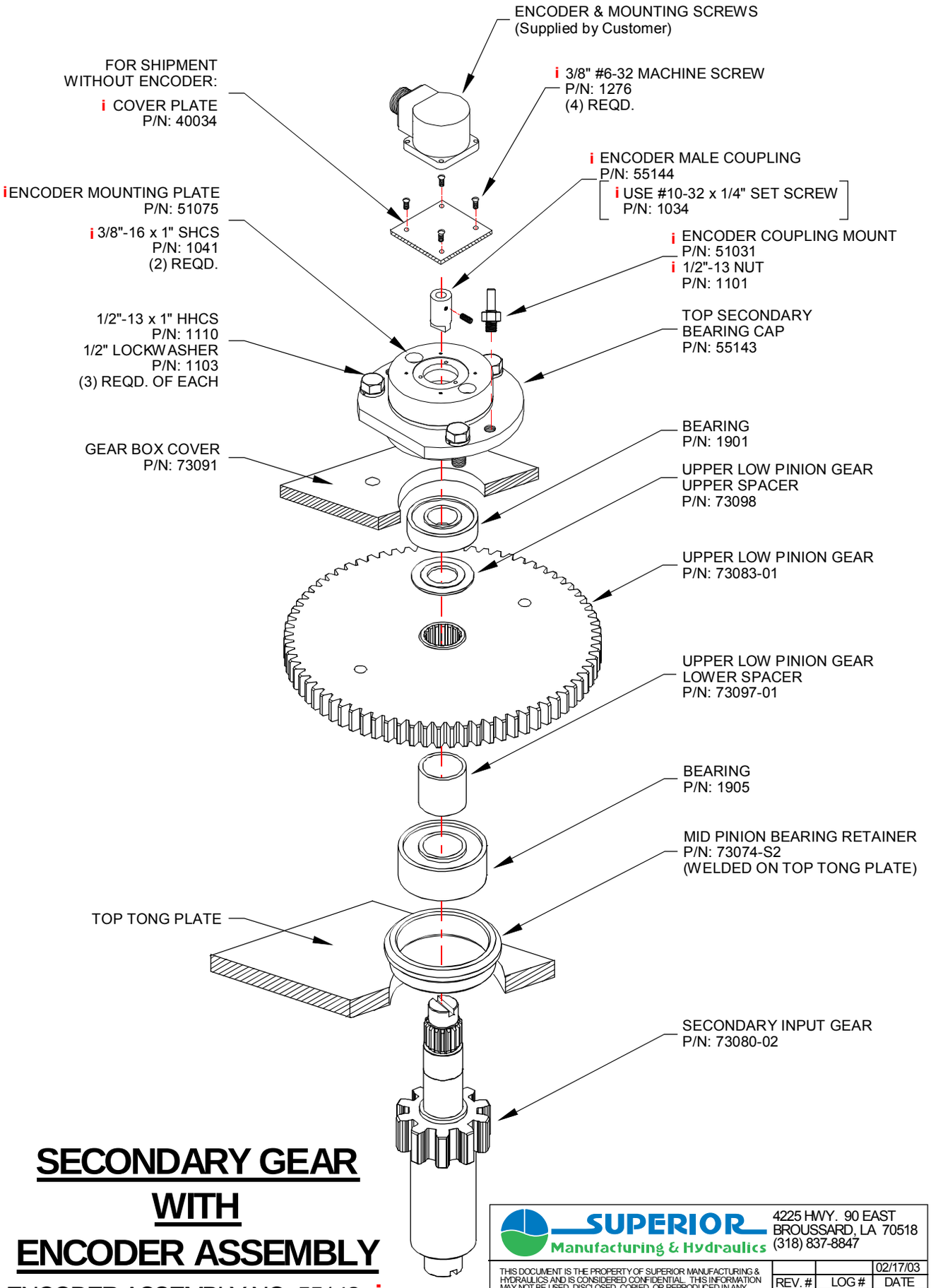
		02/17/03
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\CLE14000DP\Secondary Gear.wpg



SECONDARY GEAR WITH ENCODER ASSEMBLY

ENCODER ASSEMBLY NO. 55142 i

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		02/17/03
REV. #	LOG #	DATE

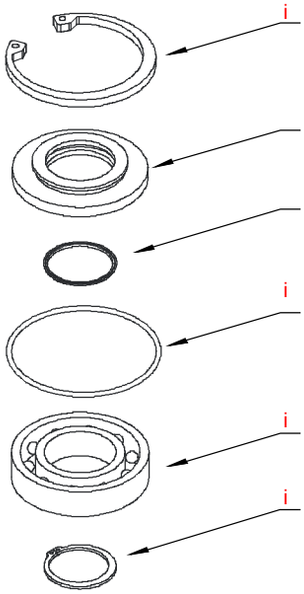
REF: S:\Equip Manuals-Dwgs\CLE14000DP\Secondary wEncoder.wpg

CLE8625DP-03
MOTOR SHAFT
P/N: 73040

CLE8625DP-05
MOTOR SHAFT
P/N: 73040-01

NOT SHOWN:

	P/N	QTY	DESCRIPTION
i	150300	1	ROTOR-RINEER
i	150430	2	DOWEL PINS RINEER
i	150600	1	PLATE F/STACKED GA15 RINEER MOTOR SINGLE & 2 SPEED
i	150601	2	PLATE F/2 SPEED GA15 RINEER MOTOR
i	150930	1	STATOR VANE KIT-RINEER
i	1608	1	HEX PLUG O RING 3/8"
i	2-160	2	O RING 5 1/4" ID, 5 7/16" OD, 3/32" W
i	73099-S2	1	RINEER GA8 STACKED STATOR 0150404S



i SNAP RING
P/N: 0150111

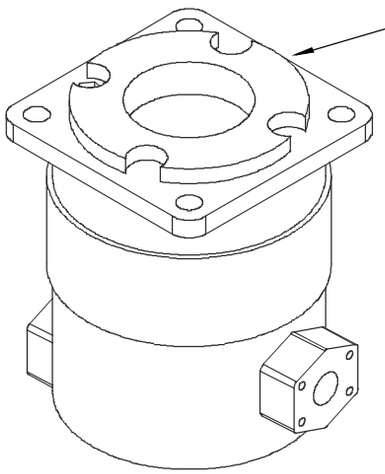
SEAL RETAINER
P/N: 55088

POLYPACK
P/N: 12501437

i O-RING
2 7/8" ID, 3 1/16" OD, 3/32" W
P/N: 2-150

i MOTOR SHAFT BEARING
P/N: 0150710

i SNAP RING
P/N: 1945



RINEER GA-15 MOTOR
P/N: 73099-S1

i COMPONENTS OF MOTOR 73099-S1

MOTOR ASSEMBLY

ASSEMBLY NO. 73099

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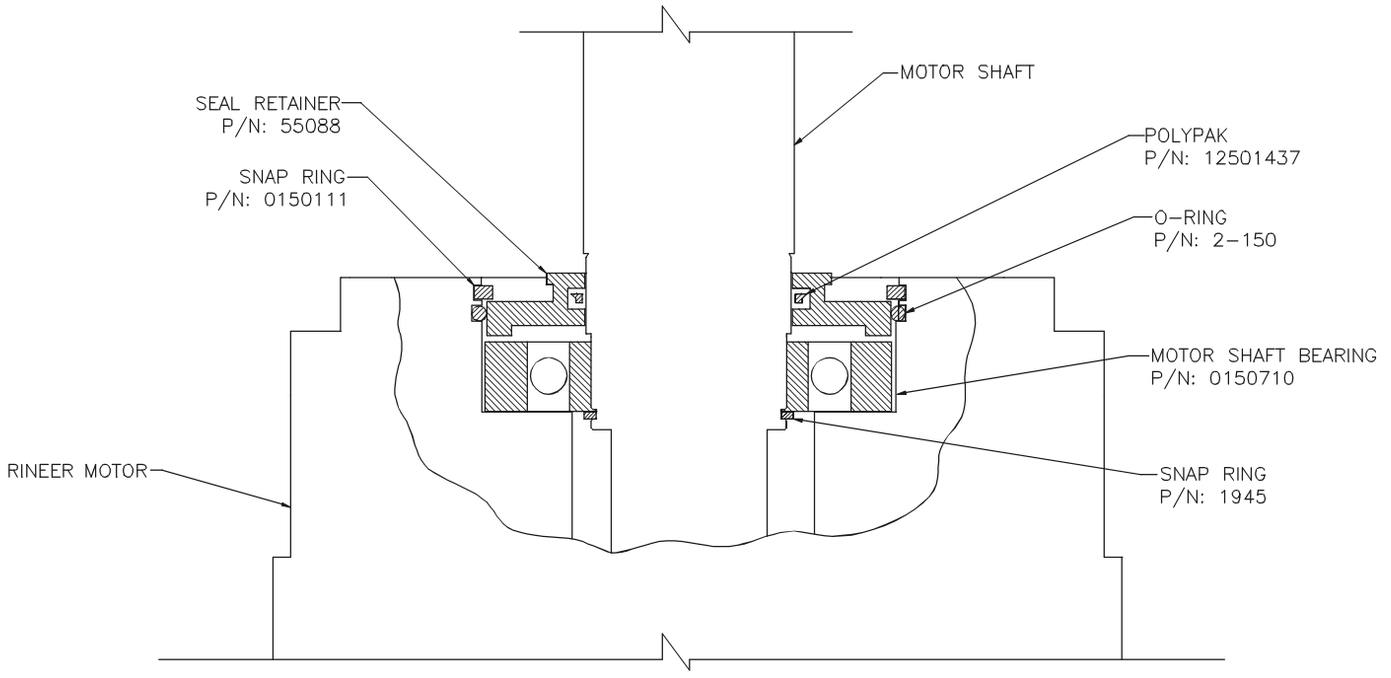
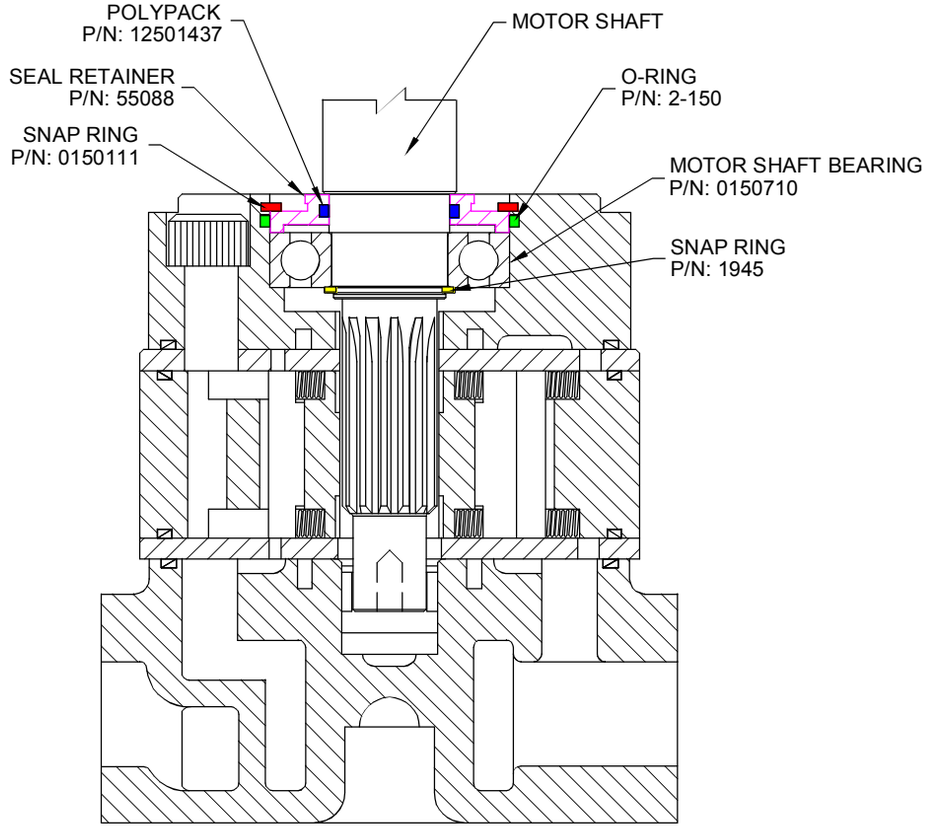
REV. #	LOG #	DATE
1		07/10/02

REF: S:\Equip Manuals-Dwgs\CLE8625DP\Motor rev1.wpg





W/ OUT WIPER RING

MOTOR ASSEMBLY

FOR CLARITY PURPOSE ONLY
NOT TO SCALE

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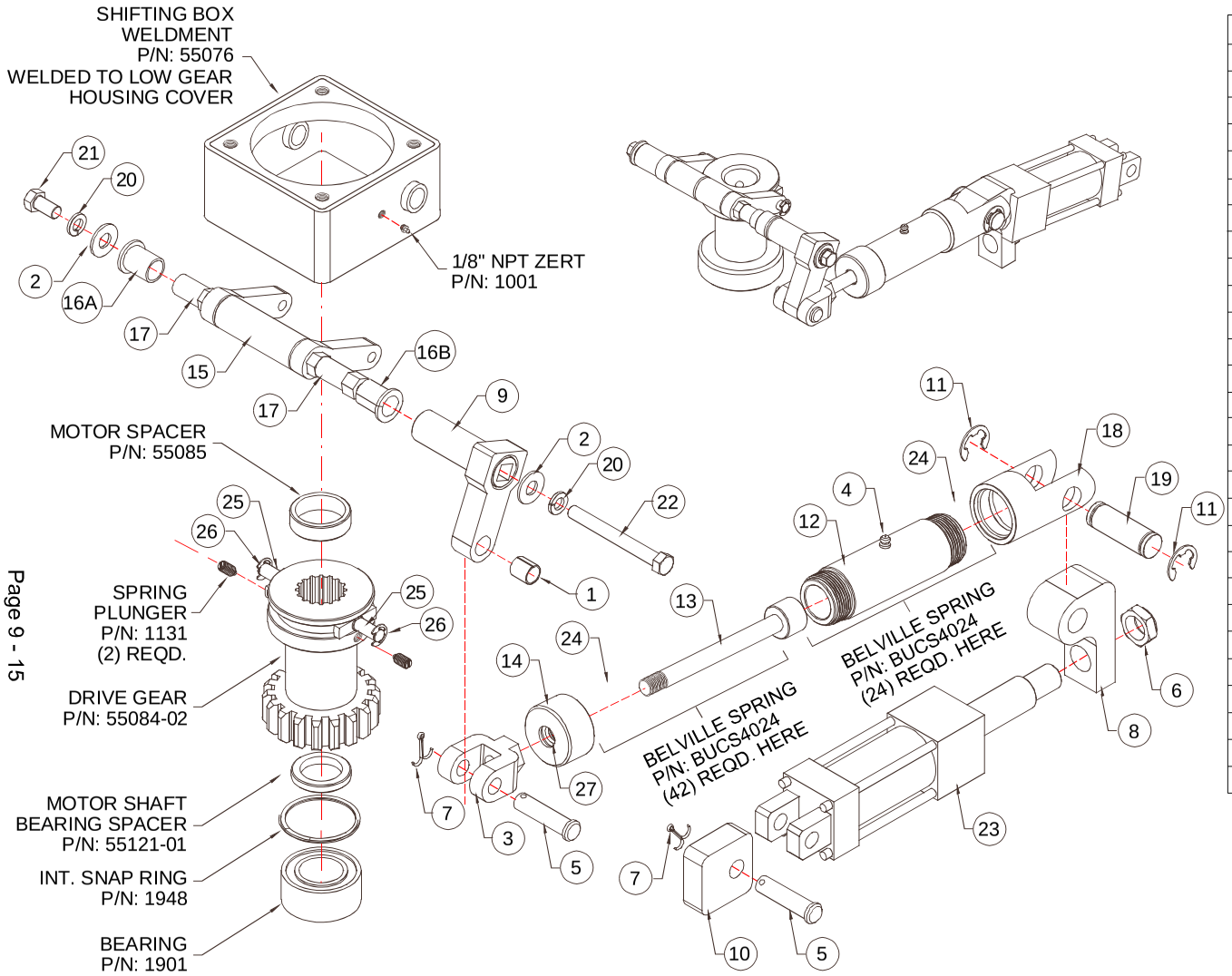
REV. #	LOG #	DATE
1		09/03/02

REF: S:\Equip Manuals-Dwgs\Motor\Motor CLE5500+ sht2 rev1.wpg



Item	Qty.	Part Number	Description
1	1	2046	GARLOCK BUSHING 08DU10
2	2	1025	3/8" FLAT WASHER
3	1	1099	ROD CLEVIS (RC-0605)
4	1	1004	3/16" DRIVE ZERT
5	2	10041	CLEVIS PIN (CLP-172S)
6	1	1176-B	3/4"-16 NYLOCK NUT LO PROFILE
7	2	1252B	1/8" x 1" SS COTTER PIN
8	1	14723	SHIFT CYLINDER LINK
9	1	14724	SHIFTER ARM WELDMENT
10	1	14726	CYLINDER MOUNT
11	2	1942-A	EXT. SNAP RING (1500-X74)
12	1	2079	SPRING HOUSING
13	1	2080	PISTON ROD
14	1	2081	FRONT END CAP
15	1	45072	SHIFTING YOKE WELDMENT
16A	1	45092	SELF LUBRIC. FLANGE BEARING
16B	2	45106	SELF LUBRIC. FLG. BRG. MODIF.
17	1	45143	SHIFTER SHAFT
18	1	82057	END CAP
19	1	82106	CLEVIS PIN
20	2	1027	3/8" LOCKWASHER
21	1	1046	3/8"-16 x 3/4" HHCS
22	1	1071	3/8"-16 x 3 1/2" HHCS
23	1	2047-01	REMOTE SHIFT CYLINDER
24	66	BUCS4024	BELVILLE SPRING
25	2	45164	SHIFTING YOKE BEARING PIN
26	2	73065	E-TYPE RETAINER RING
27	1	959-1	1/2" ROD WIPER

REMOTE SHIFT CYLINDER ASSEMBLY

ASSEMBLY NO. 14722

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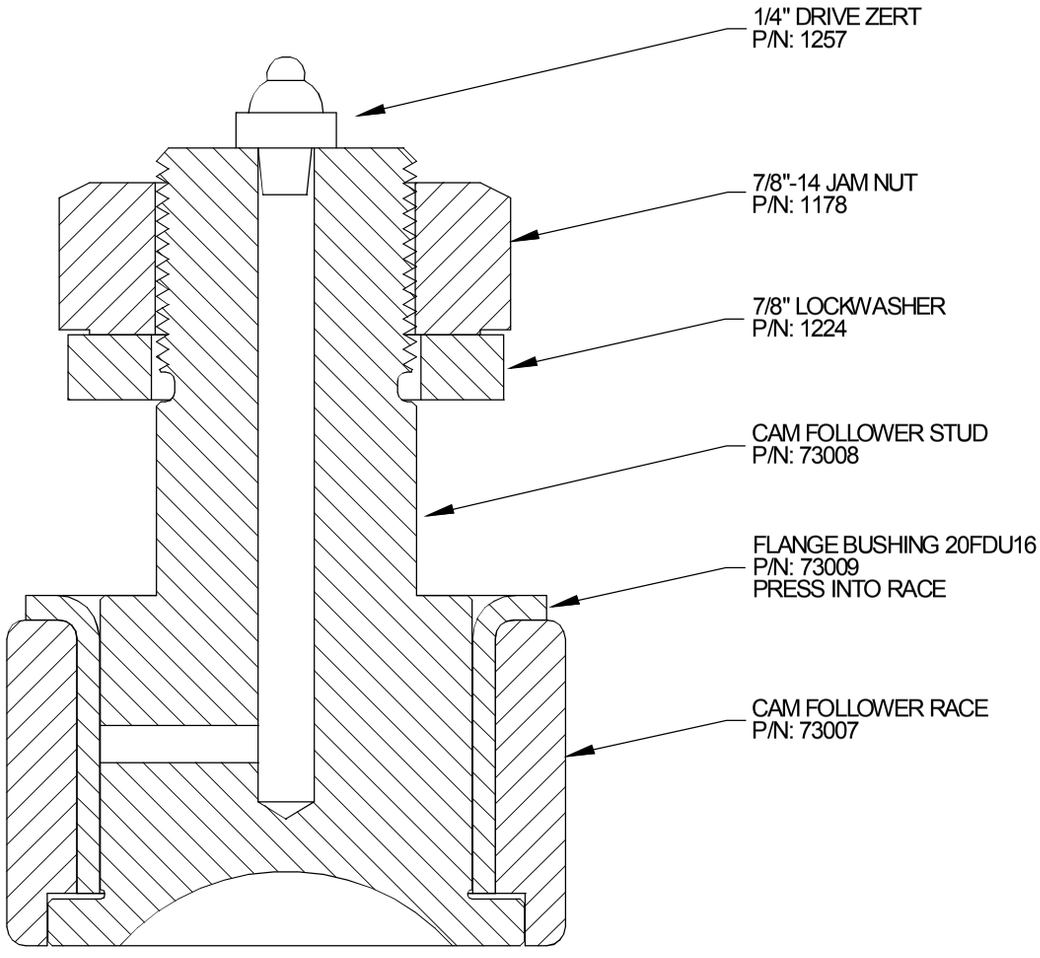
REV. #	LOG #	DATE
1		09/28/05

REF: S:\Equip Manuals\Dwgs\CLE14000DP01\Remote Shift Cyl rev1.wpg



SECTION VIEW

1 7/8" SEVERE SERVICE CAM FOLLOWER

ASSEMBLY NUMBER SSCF1875

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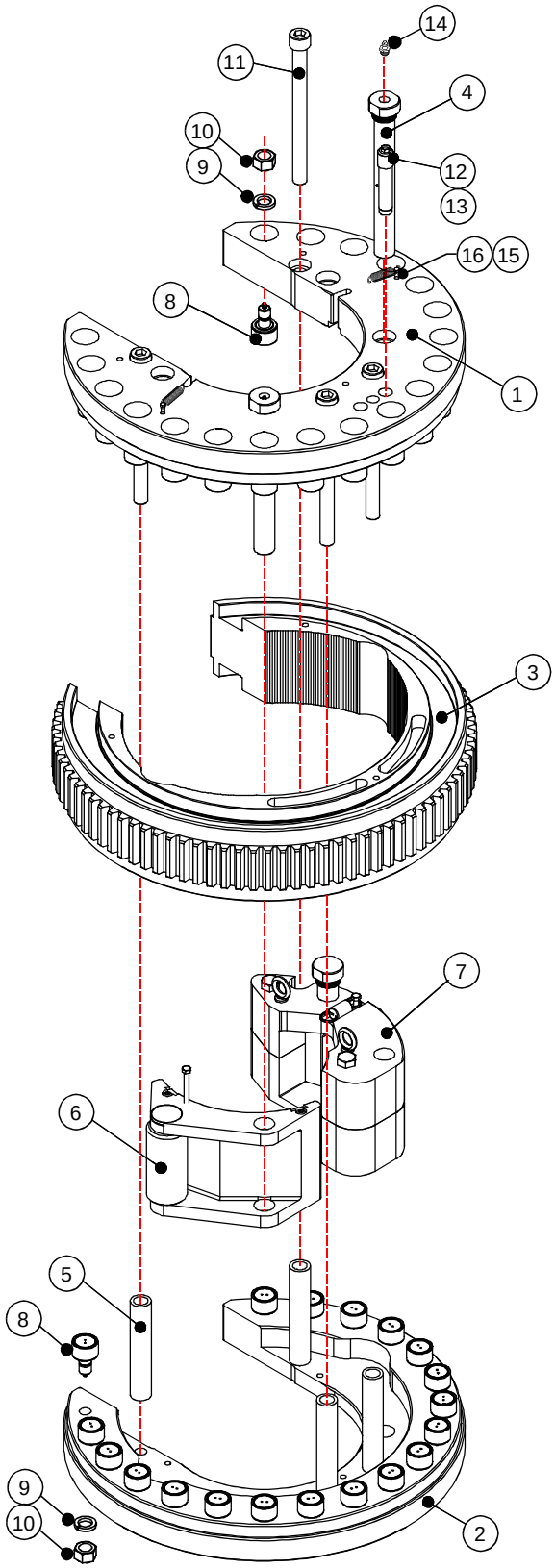
		01/27/00
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\CLE8625DP\SSCF1875.wpg

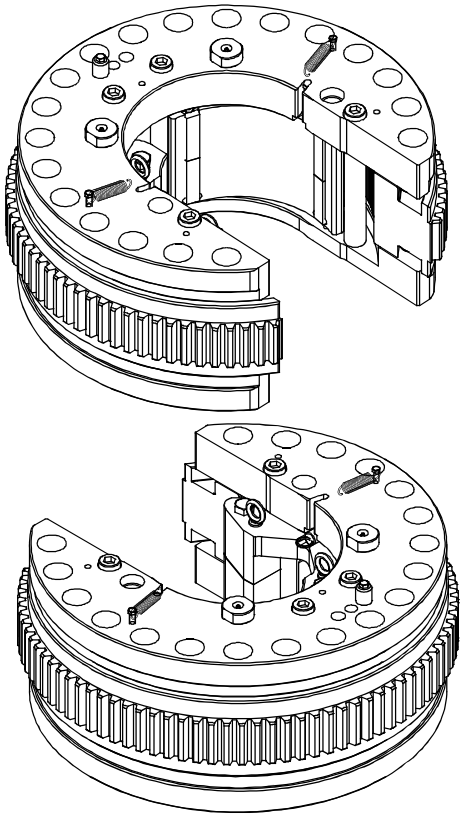


	Item	Qty.	Part Number	Description
★	1	1	14007-02	TOP CAGE PLATE F/CLE14000DP
	OR	1	14007-03	TOP CAGE PLATE F/CLE14000DP02
	2	1	14008-02	BOTTOM CAGE PLATE
	3	1	14009-02	RING GEAR F/CLE14000DP & DP02
	OR	1	14009-03	RING GEAR F/CLE14000DP03
★	4	2	14623	DOOR PIVOT PIN
	OR	2	14623-01 ●	DOOR PIVOT PIN
	5	4	14647	CAGE PLATE SPACER
	6	1	CJDT14X_ _ _ _ _	DOVETAIL JAW SET
	7	1	14693	LEFT JAW ASSEMBLY
			NOT SHOWN:	
		1	14694	RIGHT JAW ASSEMBLY
	8	38	SSCF1875	CAM FOLLOWER ASSEMBLY
■	9	38	1224	7/8" HEAVY SPLIT LOCKWASHER
■	10	38	1178	7/8"-14 JAM NUT
	11	4	1093	1"-8 x 12" SHCS
	12	1	14729	LOCKING PIN
	13	1	1046	3/8"-16 x 3/4" HHCS
	14	2	1001	1/8" NPT ZERT
	15	2	58102	EXTENSION SPRING
	16	2	1047	3/8"-16 x 1" HHCS

★ S/N'S: 5077, 5078, 5132 & 5133

● MFG. STARTING 06/05/03

■ COMPONENTS OF SSCF1875



CAGE PLATE ASSEMBLY

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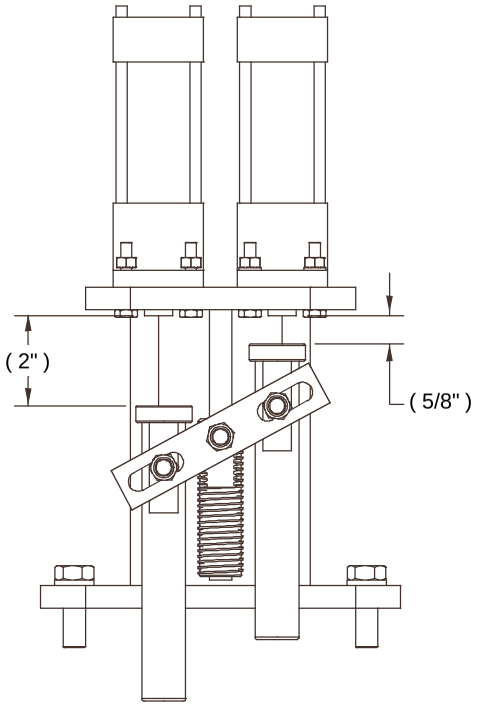
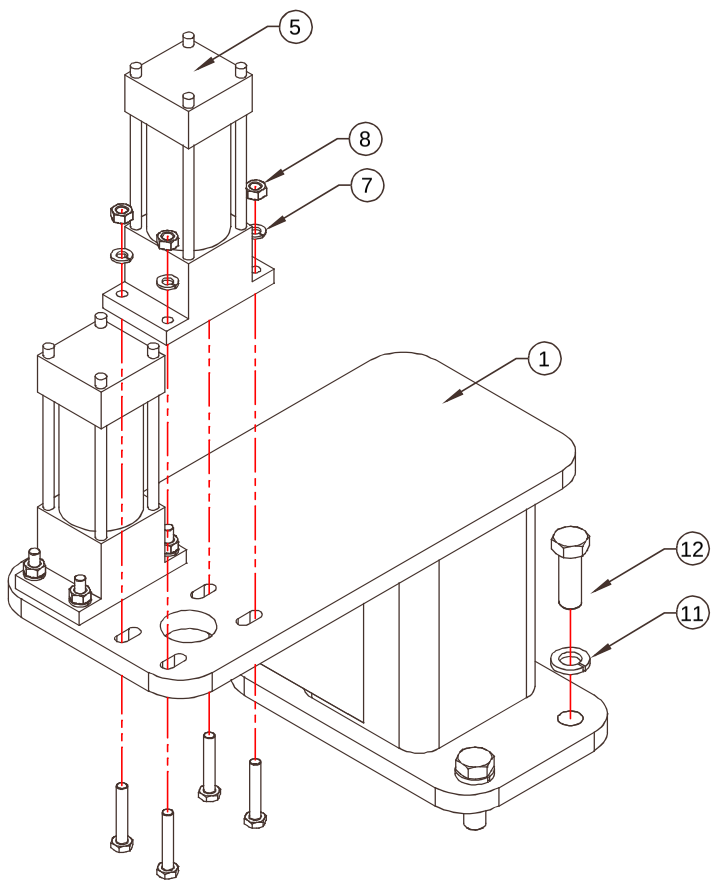
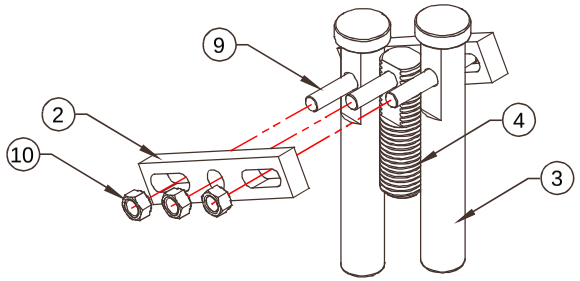
REV. #	LOG #	DATE
2		07/19/06

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000DP\Cage Plate rev2.wpg

Item	Qty.	Part Number	Description
1	1	14701	REVERSING CYLINDER MOUNT WELDMENT
2	2	71073	LOCKING PIN CROSS BAR
3	2	73106	AUTO REVERSING PIN
4	1	78058	REVERSING PIN PIVOT STUD
5	2	13606	REVERSING PIN CYLINDER ,1 1/2" B, 2" S W/5/8"R, SS ROD
6	8	107	1/4"-20 x 1 1/2" HHCS
7	8	101	1/4" LOCKWASHER
8	8	100	1/4"-20 NUT
9	3	144	3/8"-16 x 2 1/2" HHCS
10	3	1024	3/8"-16 NUT
11	4	1103	1/2" LOCKWASHER
12	4	1112	1/2"-13 x 1 1/2" HHCS







REVERSING PIN ASSEMBLY

ASSEMBLY NO. 14700

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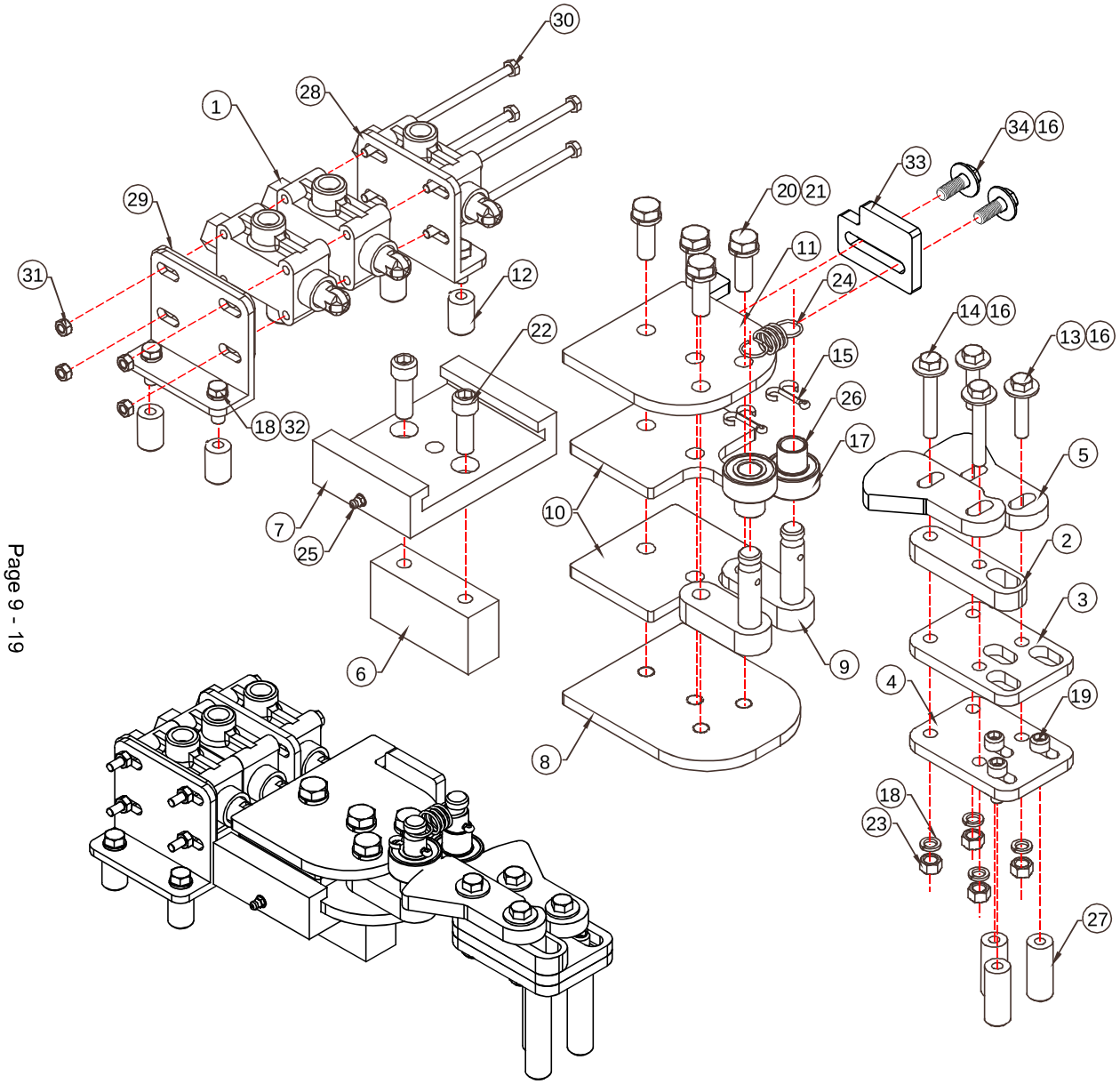
		04/10/03
REV. #	LOG #	DATE

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000DP01\Rev Pin.wpg



Item	Qty.	Part Number	Description
1	3	SLV1000-01	CAM SWITCH VALVES
2	1	73157	UPPER MOUNTING PLATE
3	1	73158	MID MOUNTING PLATE
4	1	73159	BOTTOM MOUNTING PLATE
5	2	73161-01	CAM PLATE
6	1	73163	CAM MOUNT
7	1	73167	CAM PLATE GUIDE
8	1	73168	OUTER CAM PLATE
9	2	73170	CAM SWITCH FLAP WELDMENT
10	2	73172	CAM SWITCH MID PLATE
11	1	73174	OUTER CAM PLATE
12	4	73179	VALVE LEG 1 1/4" LONG
13	2	141	3/8"-16 x 1 3/4" HHCS
14	2	1060	3/8"-16 x 2 1/2" HHCS
15	2	1016	1/8" x 1" SS COTTER PIN
16	6	1025	3/8" FLAT WASHER
17	2	1915	BEARING .693 ID x 1.5748 OD x 11/16
18	8	1027	3/8" LOCKWASHER
19	3	1041	3/8"-16 x 1" SHCS
20	4	1103	1/2" LOCKWASHER
21	4	1112	1/2"-13 x 1 1/2" HHCS
22	2	1106-A	1/2"-13 x 1 1/2" SHCS
23	4	1024	3/8"-16 NUT
24	1	73188	EXT. SPRING 3/4" OD x 1 7/8" L x .075 W
25	1	1001	1/8" NPT ZERT
26	2	1940-A	INNER RACE IR-7173-C
27	3	73195	VALVE LEG 3 1/2" LONG
28	2	10056	CAM SWITCH MOUNTING BRACKET
29	1	2056	CAM SWITCH MNTG. BRACKET DOUBLER
30	4	2069	1/4"-20 x 6" HHCS
31	4	212	1/4"-20 NYLOCK NUT
32	4	1047	3/8"-16 x 1" HHCS
33	1	73171	CAM SWITCH STOP
34	2	1046	3/8"-16 x 3/4" HHCS

OPEN THROAT CAM POSITIONER ASSEMBLY

ASSEMBLY NO. 73165

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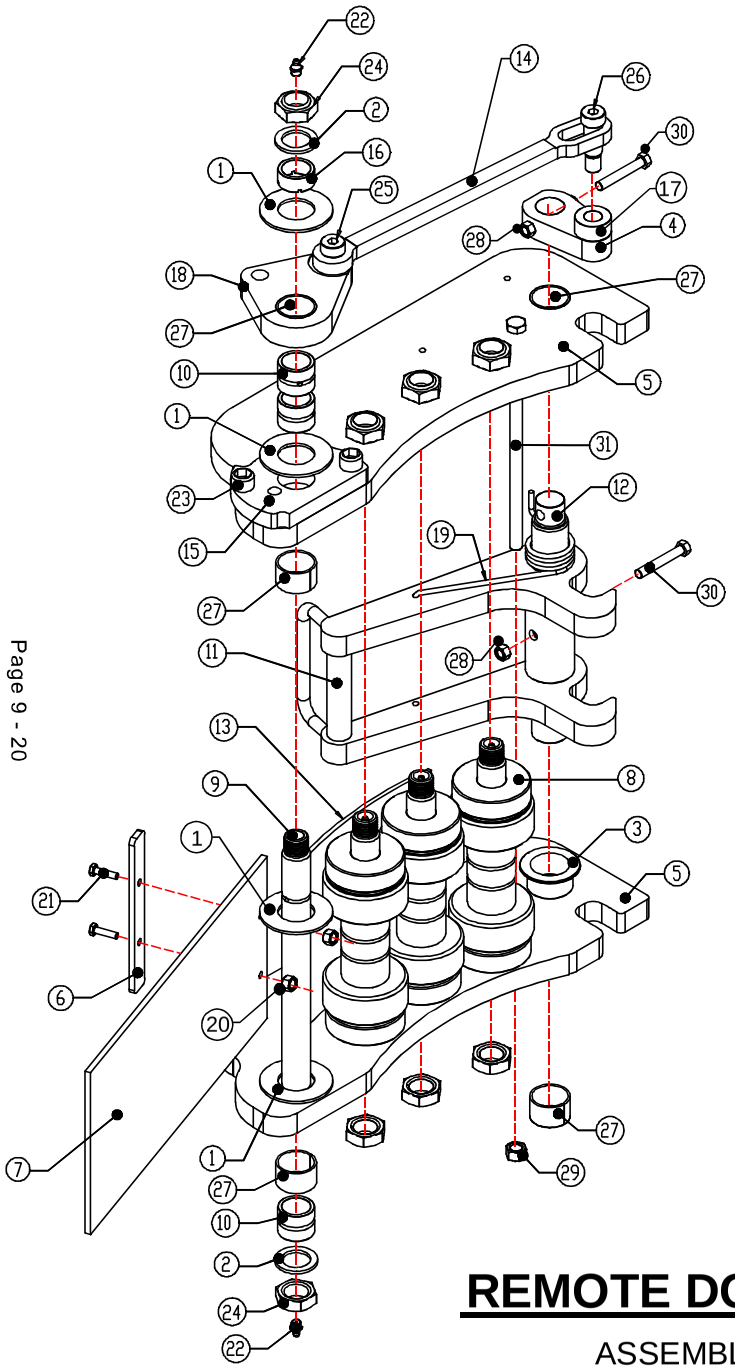
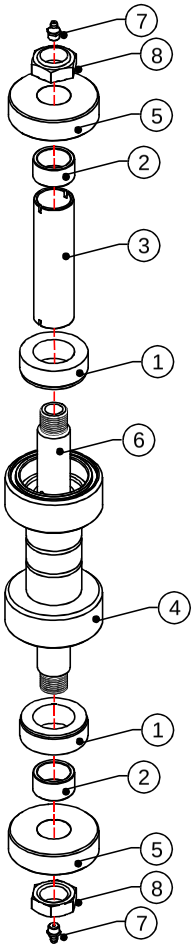
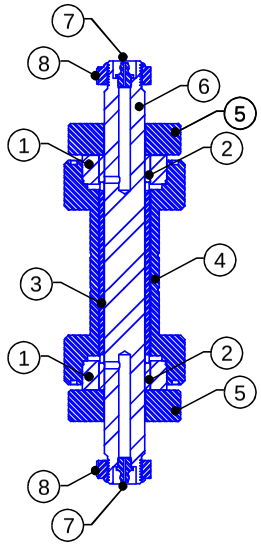
REV. #	LOG #	DATE
2		06/28/06

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000DP01\Cam Positioner rev2.wpg



Item #	Qty.	Part Number	Part Name
1	4	2025	TONG DOOR THRUST SPACER
2	2	2040	DOOR BUSHING
3	1	55027	DOOR BUSHING
4	1	82042	ARM
5	2	14604-S1	TONG DOOR PLATE
6	1	14672	DOOR FLAP MOUNTING PLATE
7	1	14673	RUBBER DOOR FLAP
8	3	14675	DOOR DUMBELL ROLLER ASSEMBLY
9	1	14678	DOOR PIVOT SHAFT
10	3	14679	DOOR PIVOT BUSHING
11	1	14681	DOOR LATCH WELDMENT
12	1	14682	DOOR LATCH PIVOT PIN
13	1	73101-S1	TONG DOOR COVER
14	1	14686	DOOR LATCH LINKAGE
15	1	14732-01	DOOR SPACER
16	1	14733	DOOR PIVOT BUSHING
17	1	14734	DOOR ARM SPACER
18	1	14716	DOOR PIVOT LINKAGE
19	1	SMH1501-N	TORSION SPRING
20	2	100	1/4"-20 HEX NUT
21	2	105	1/4"-20 x 1" HHCS
22	2	1001	1/8" NPT ZERT
23	2	1153-A	5/8"-11 x 3/4" SHCS
24	2	1213	1"-12 LOW PROFILE NYLOCK NUT
25	1	1676	3/4" x 5/8" SS SHOULDER BOLT 5/8"-11
26	1	1682	3/4" x 1 1/2" SS SHOULDER BOLT 5/8"-11
27	5	2021	BUSHING 24DU16 - 1 1/2" ID x 1"
28	2	1024	3/8"-16 HEX NUT
29	1	1101	1/2"-13 HEX NUT
30	2	1060	3/8"-16 x 2 1/2" HHCS
31	1	1128	1/2"-13 x 11 HHCS





SECTION

REMOTE DOOR ASSEMBLY

ASSEMBLY NO. 14680-01

DOOR DUMBELL ROLLER ASSEMBLY NO. 14675

Item #	Qty.	Part Number	Part Name
1	2	55191	DUMBELL ROLLER BUSHING
2	2	55192	DUMBELL ROLLER SPACER
3	1	73071	DUMBELL ROLLER SPACER
4	1	14308	DOOR DUMBELL ROLLER
5	2	14676	DOOR ROLLER SPACER
6	1	14677	DOOR DUMBELL SHAFT
7	2	1001	1/8" NPT ZERT
8	2	1213	1"-12 LOW PROFILE NYLOCK NUT

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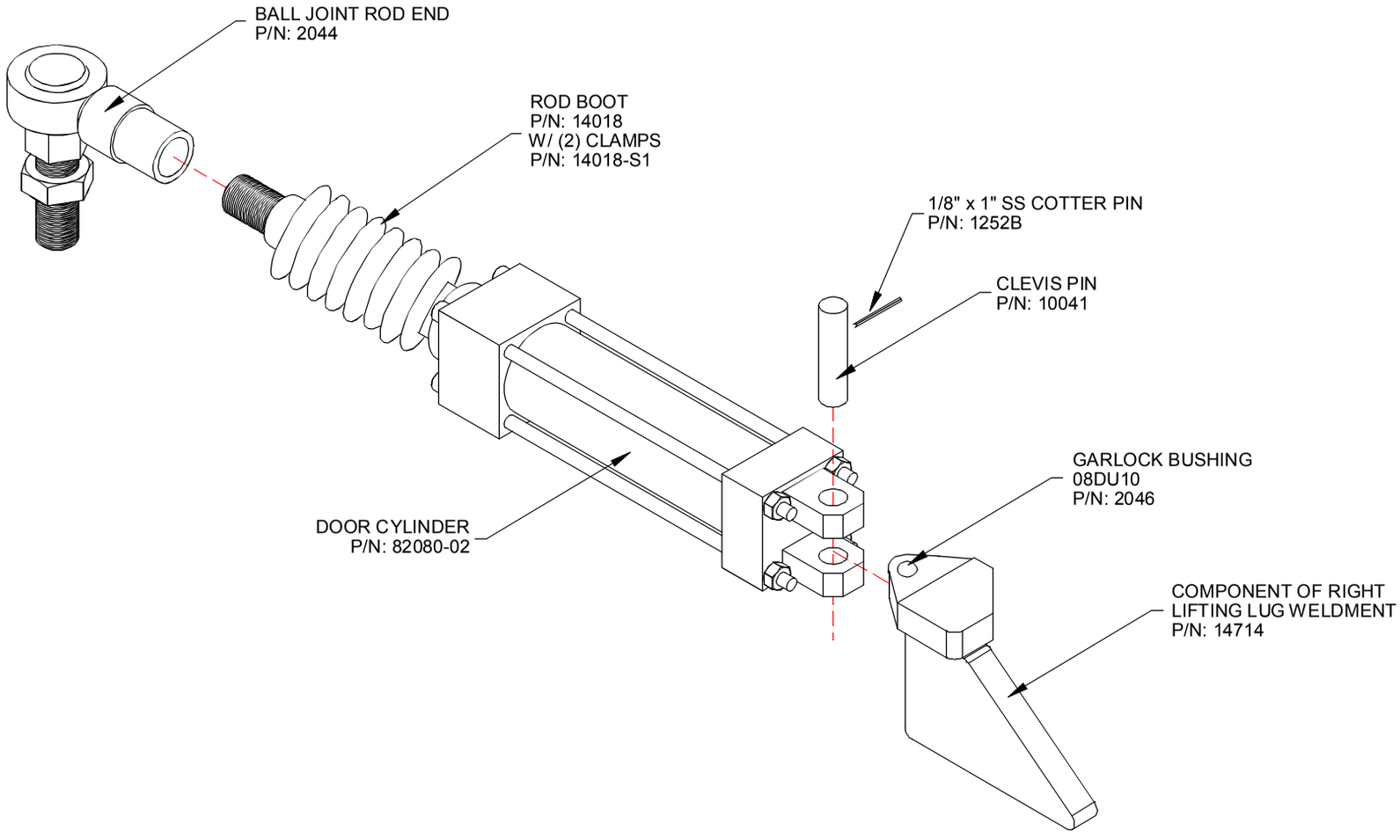
REV. #	LOG #	DATE
1		09/27/05

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000DP01\14680-01 rev1.wpg



OPTIONAL
DOOR CYLINDER ASSEMBLY

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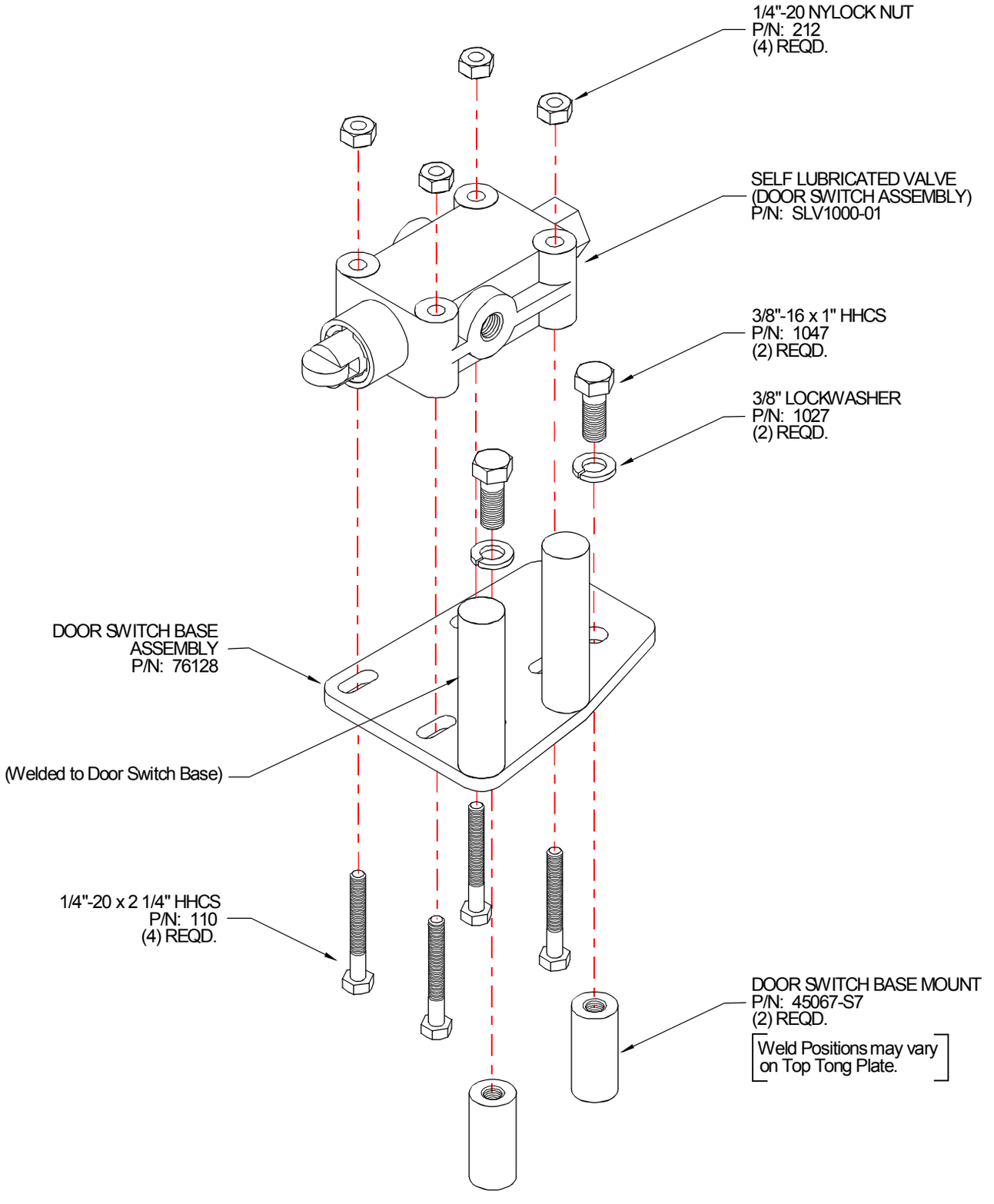
REV. #	LOG #	DATE
		04/14/03

REF: S:\Equip Manuals\Dwgs\CLE14000DP01\Door Cylinder.wpg



DOOR SWITCH ASSEMBLY

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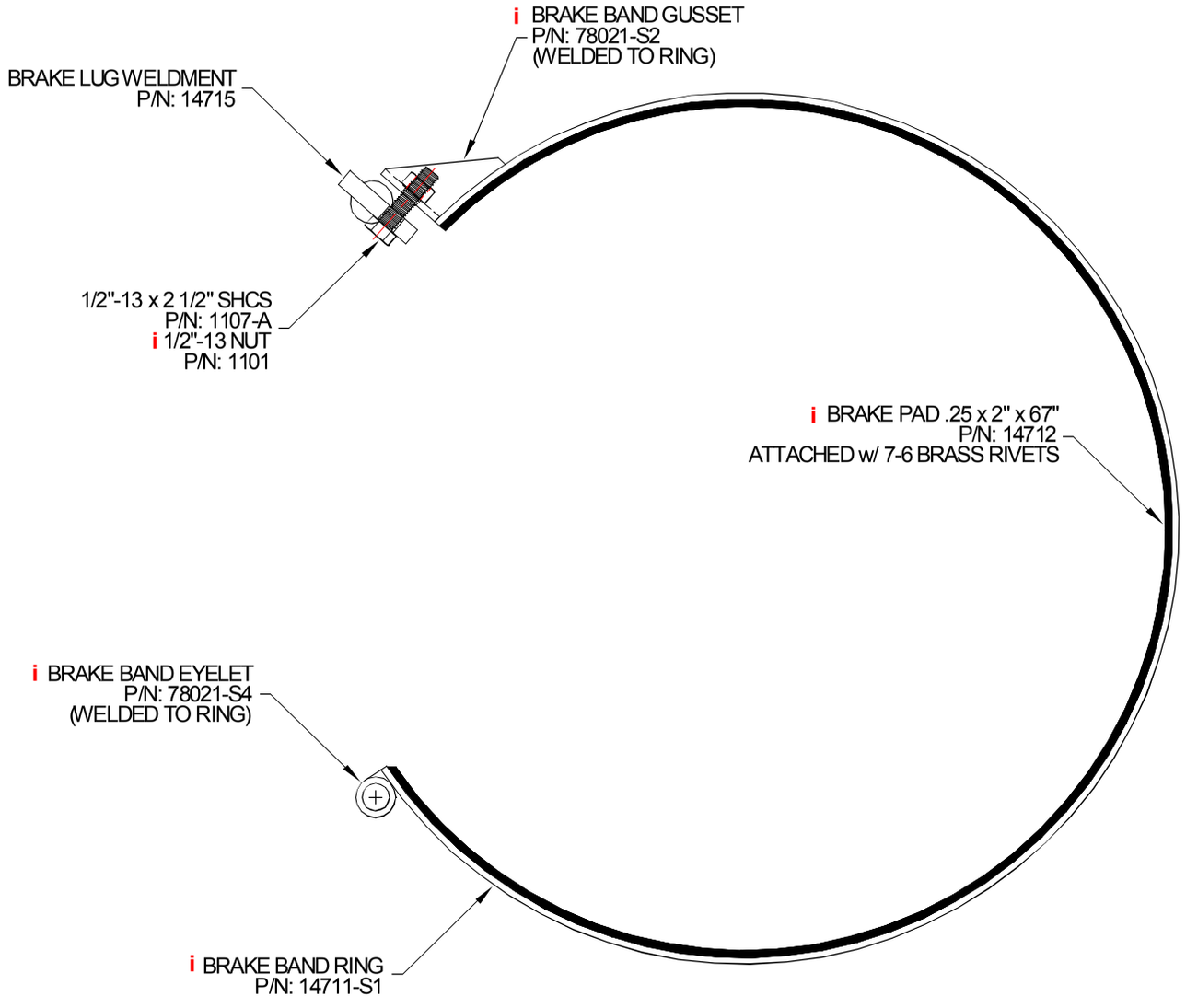
REV. #	LOG #	DATE
		02/17/03

REF: S:\Equip Manuals-Dwgs\CLE14000DP\Door Switch.wpg



BRAKE BAND ASSEMBLY

WELDMENT NUMBER 14711 i

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		02/17/03
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\CLE14000DP\Brake Band.wpg

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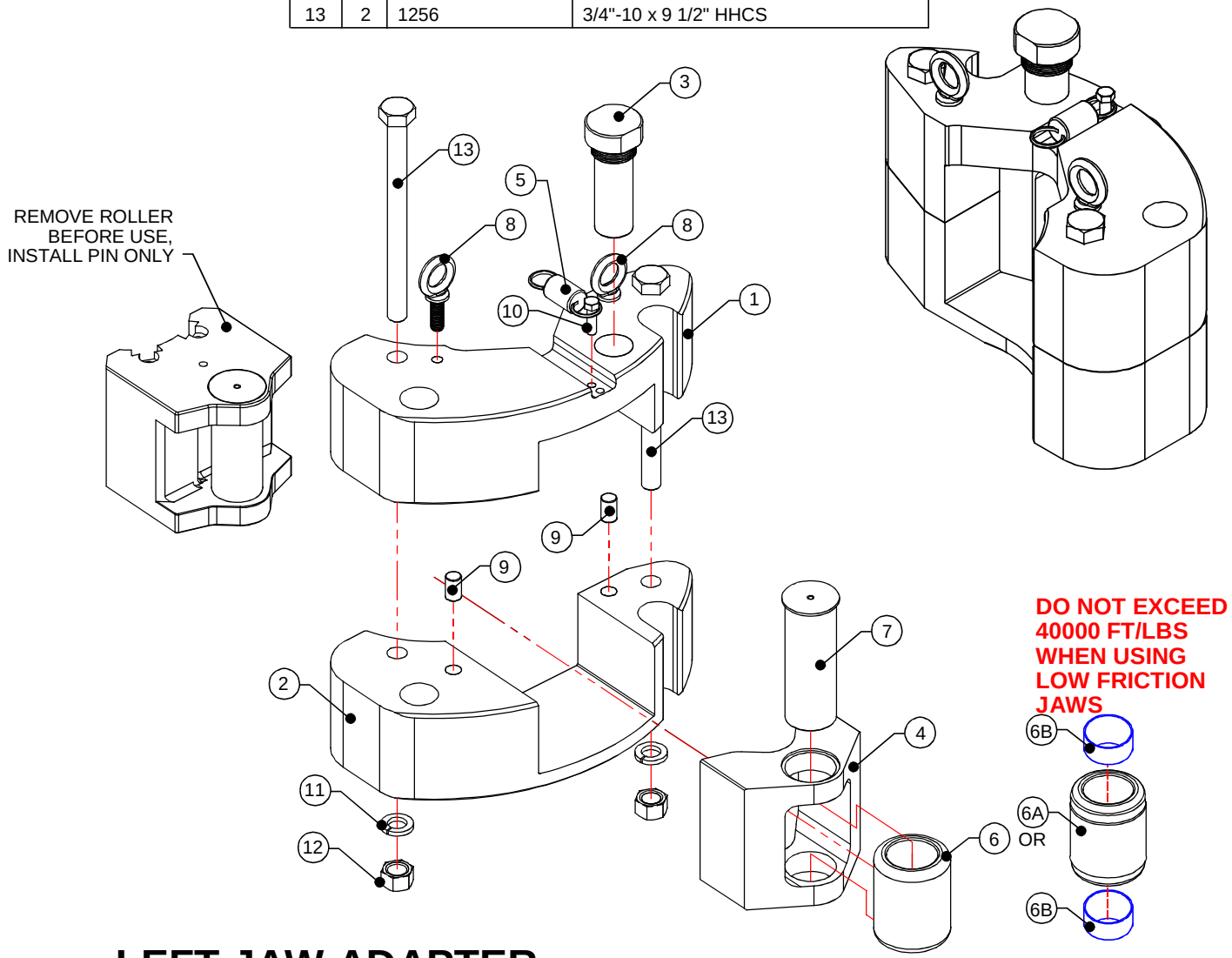
Item	Qty.	Part Number	Description
1	1	14689	TOP LEFT JAW ADAPTER
2	1	14690	BOTTOM LEFT JAW ADAPTER
3	1	14695	DOOR PIVOT LOCK
4	1	14697	JAW PUSHER
5	1	14699	EXTENSION SPRING
6	1	73012-01	JAW ROLLER OR
6A	1	73012-02	LOW FRICTION JAW ROLLER
			F/ WRAP AROUND DIES OR
			VERY SMALL PIPE APPLICATIONS
6B	2	32DU28	2" x 1 3/4" DU BEARING F/ LF ROLLER
7	1	73013-01	JAW PIN
8	2	BUCT7631	1/2" x 1 1/2" FORGED EYE BOLT
9	2	10039	.625 DIA. X 1 L. DOWEL PIN
10	1	1048	3/8"-16 x 1 1/4" HHCS
11	2	1171	3/4" LOCKWASHER
12	2	1176-A	3/4"-10 HEX NUT
13	2	1256	3/4"-10 x 9 1/2" HHCS



LEFT JAW ADAPTER ASSEMBLY

ASSEMBLY NO. 14693
COMPLETE SET ASSEMBLY NO. 14698

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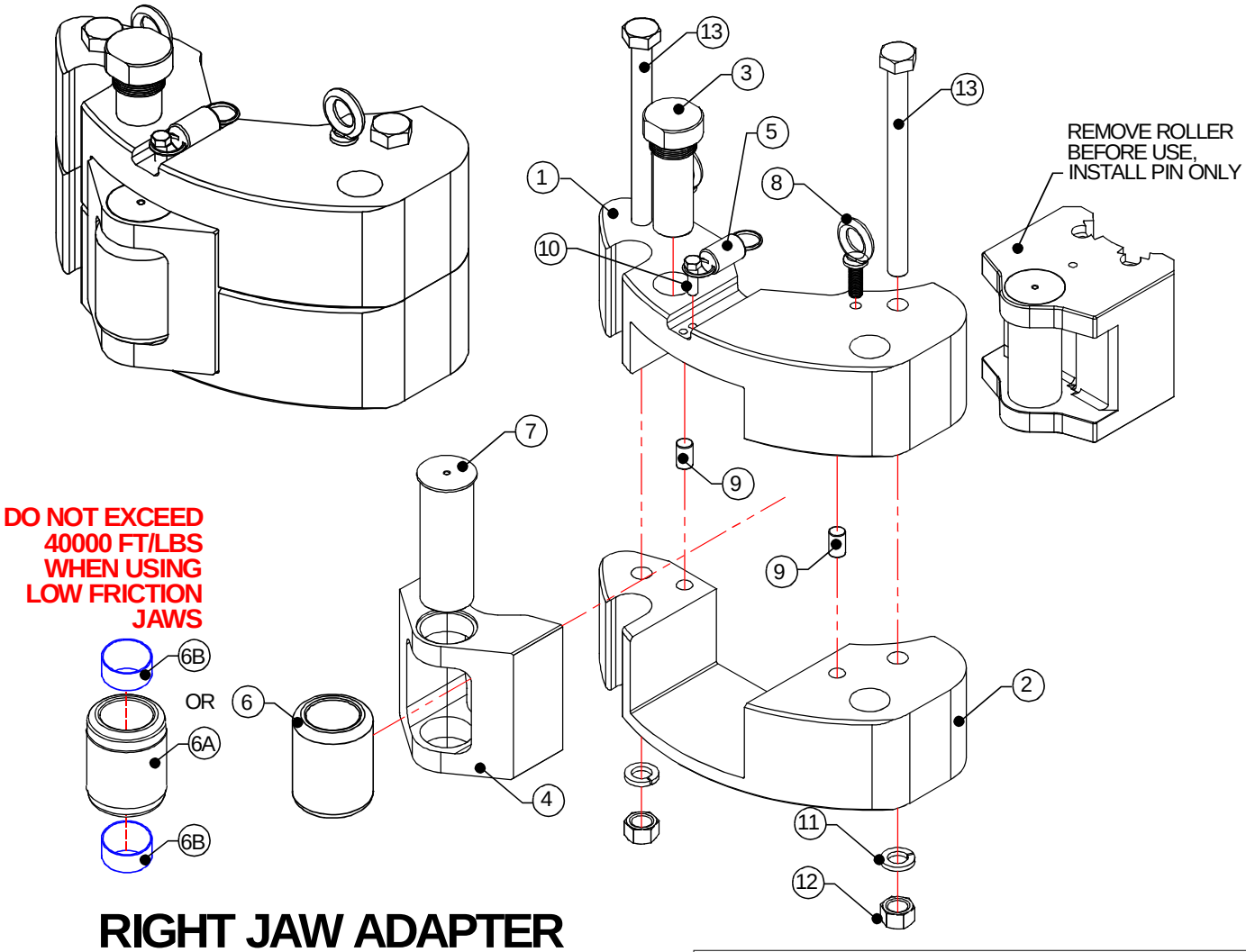
REV. #	LOG #	DATE
3		01/16/06

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000DP\Jaw Adapter L rev3.wpg

Item	Qty.	Part Number	Description
1	1	14691	TOP RIGHT JAW ADAPTER
2	1	14692	BOTTOM RIGHT JAW ADAPTER
3	1	14695	DOOR PIVOT LOCK
4	1	14697	JAW PUSHER
5	1	14699	EXTENSION SPRING
6	1	73012-01	JAW ROLLER OR
6A	1	73012-02	LOW FRICTION JAW ROLLER
			F/WRAP AROUND DIES OR
			VERY SMALL PIPE APPLICATIONS
6B	2	32DU28	2" x 1 3/4" DU BEARING F/ LF ROLLER
7	1	73013-01	JAW PIN
8	2	BUCT7631	1/2" x 1 1/2" FORGED EYE BOLT
9	2	10039	.625 DIA. X 1 L. DOWEL PIN
10	1	1048	3/8"-16 x 1 1/4" HHCS
11	2	1171	3/4" LOCKWASHER
12	2	1176-A	3/4"-10 HEX NUT
13	2	1256	3/4"-10 x 9 1/2" HHCS



RIGHT JAW ADAPTER ASSEMBLY

ASSEMBLY NO. 14694
COMPLETE SET ASSEMBLY NO. 14698

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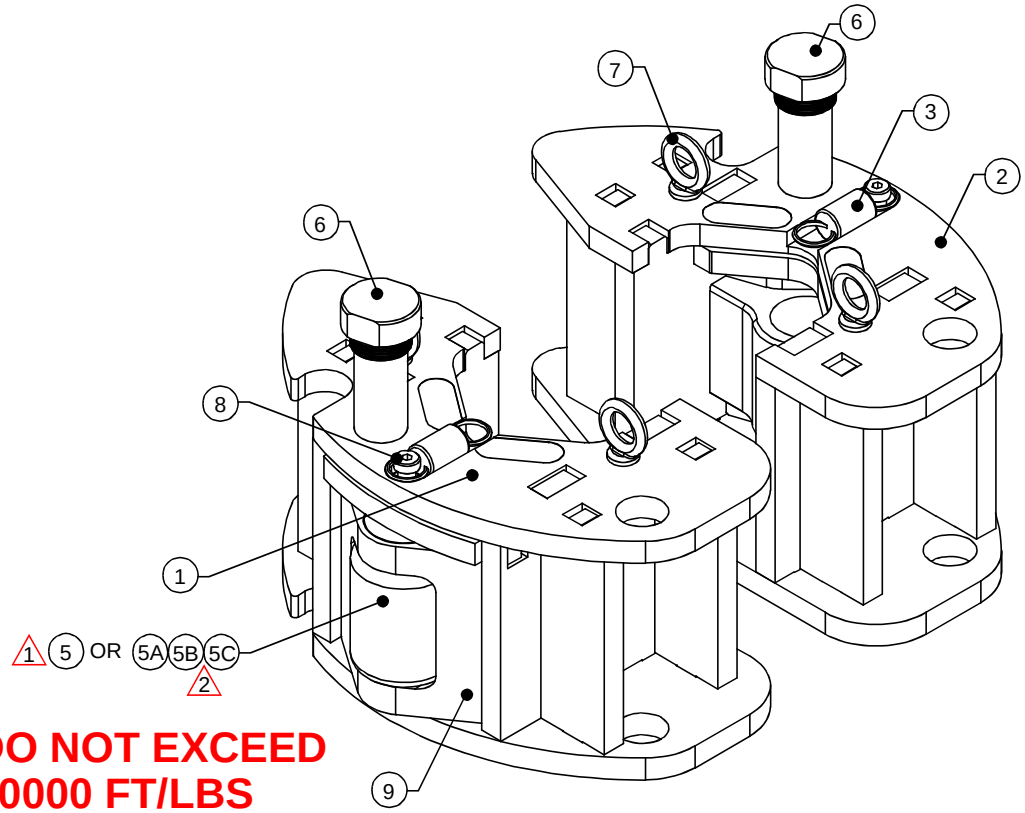
REV. #	LOG #	DATE
3		01/16/06

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000DP\Jaw Adapter R rev3.wpg

Item	Qty.	Part Number	Description
1	1	14DPA-0525-R	RIGHT JAW ADAPTER WELDMENT
2	1	14DPA-0525-L	LEFT JAW ADAPTER WELDMENT
3	2	14699	EXTENSION SPRING
4	2	73013-02	JAW PIN
~~5~~	~~2~~	~~73012-01~~	~~JAW ROLLER OR~~ △1
5A	2	73012-02	LOW FRICTION JAW ROLLER
			F/ WRAP AROUND DIES OR
			VERY SMALL PIPE APPLICATIONS
5B	2 △2	32DU28	2" x 1 3/4" DU BEARING F/ LF ROLLER
5C	2	32DU32 △2	2" x 2" DU BEARING F/ LF ROLLER
6	2	14695-01	DOOR PIVOT LOCK
7	4	BUCT7631	1/2" x 1 1/2" FORGED EYE BOLT
8	2	1155A	1/2" x 1" SHOULDER BOLT
9	2	14697-01	JAW PUSHER

△1 02/12/07 No longer available.

△2 04/19/07 Replaced (2) 32DU28 with (2) 32DU32.



DO NOT EXCEED 40000 FT/LBS WHEN USING LOW FRICTION JAWS & ROLLERS

14" DP JAW ADAPTER ASSEMBLY

5 1/2" TO 4 1/2"

ASSEMBLY NO. 14DPA-0525

MANUFACTURE STARTING 11/2005

APPROX. WEIGHT (LBS) = 229

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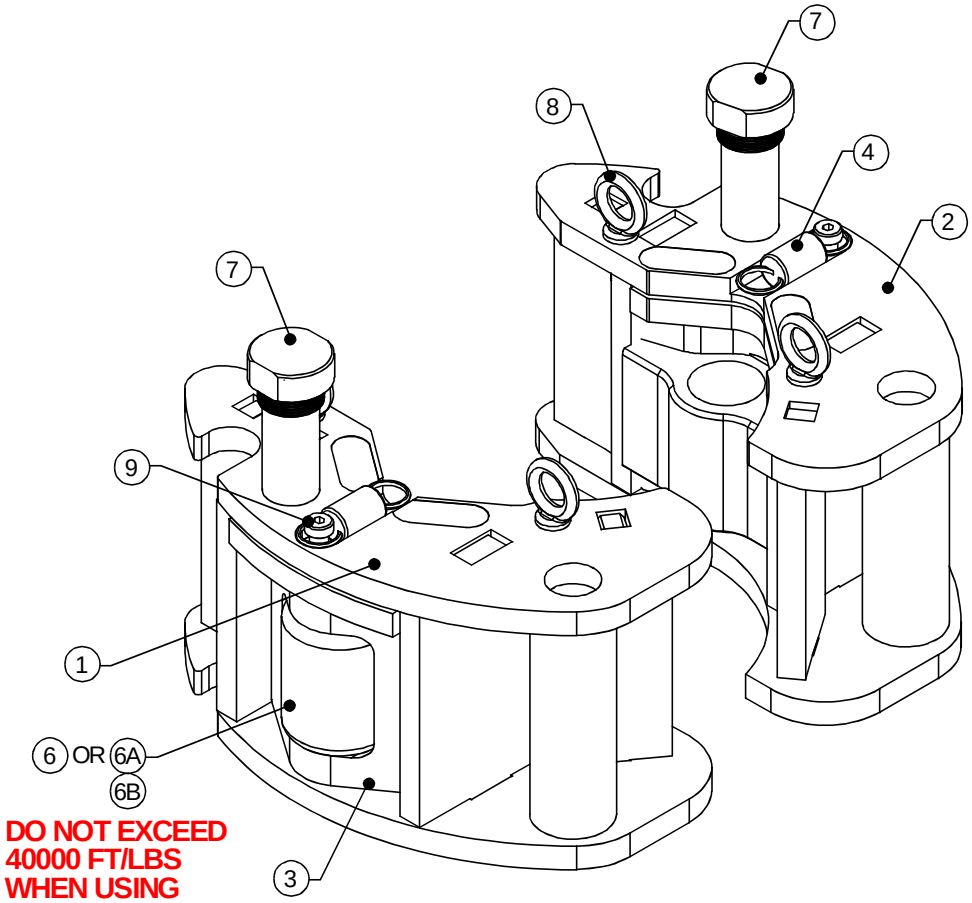
REV. #	LOG #	DATE
2		05/10/07

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000DP\14DPA-0525 Jaw rev2.wpg

Item	Qty.	Part Number	Description
1	1	14DPA-9625-R	RIGHT JAW ADAPTER WELDMENT
2	1	14DPA-9625-L	LEFT JAW ADAPTER WELDMENT
3	2	14697-01	JAW PUSHER
4	2	14699	EXTENSION SPRING
5	2	73013-02	JAW PIN
6	2	73012-01	JAW ROLLER OR
6A	2	73012-02	LOW FRICTION JAW ROLLER
			F/ WRAP AROUND DIES OR
			VERY SMALL PIPE APPLICATIONS
6B	4	32DU28	2" x 1 3/4" DU BEARING F/ LF ROLLER
7	2	14695-01	DOOR PIVOT LOCK
8	4	BUCT7631	1/2" x 1 1/2" FORGED EYE BOLT
9	2	1155A	1/2" x 1" SHOULDER BOLT



DO NOT EXCEED 40000 FT/LBS WHEN USING LOW FRICTION JAWS

14" DP JAW ADAPTER ASSEMBLY

9 5/8" TO 8 5/8"

ASSEMBLY NO. 14DPA-9625

MANUFACTURE STARTING 11/2005

APPROX. WEIGHT (LBS) = 186

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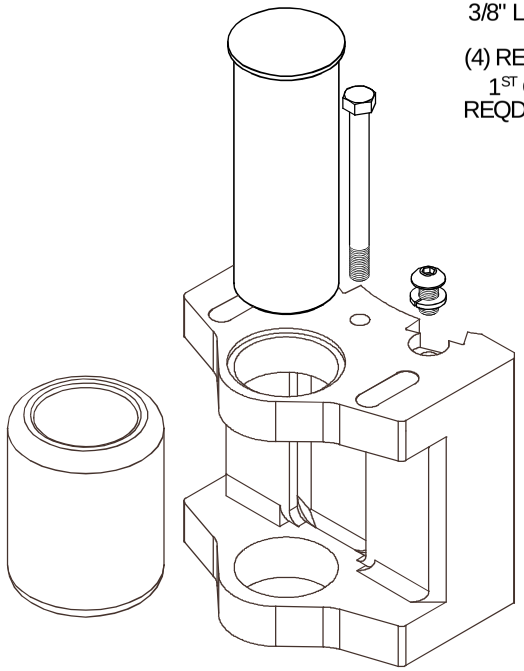
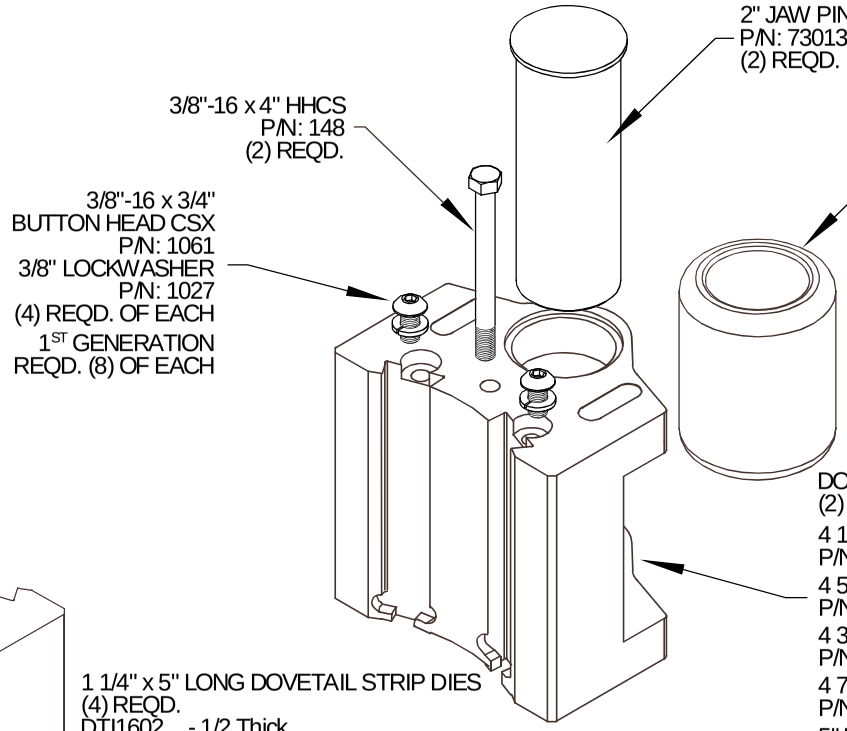
		01/16/06
REV. #	LOG #	DATE

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000DP\14DPA-9625 Jaw Adapter.wpg

***CAUTION:**
DO NOT EXCEED 40000 FT/LBS WHEN USING LOW FRICTION JAWS & ROLLERS





1 1/4" x 5" LONG DOVETAIL STRIP DIES
(4) REQD.
DTI1602 - 1/2 Thick
DTI1602D - 1/2 Thick Diamond
DTI1617D - 7/16 Thick Diamond
DTI1623 - 9/16 Thick
DTI1633 - 5/8 Thick
DTI1664 - 13/16 Thick

DOVETAIL JAW
(2) REQD.

4 1/2" DOVETAIL JAW P/N: 73014-04500	6 3/8" DOVETAIL JAW P/N: 73014-06375
4 5/8" DOVETAIL JAW P/N: 73014-04625	6 1/2" DOVETAIL JAW P/N: 73014-06500
4 3/4" DOVETAIL JAW P/N: 73014-04750	6 5/8" DOVETAIL JAW P/N: 73014-06625
4 7/8" DOVETAIL JAW P/N: 73014-04875	7" DOVETAIL JAW P/N: 73014-07000
5" DOVETAIL JAW P/N: 73014-05000	7 1/4" DOVETAIL JAW P/N: 73014-07250
5 1/4" DOVETAIL JAW P/N: 73014-05250	7 1/2" DOVETAIL JAW P/N: 73014-07500
5 1/2" DOVETAIL JAW P/N: 73014-05500	7 5/8" DOVETAIL JAW P/N: 73014-07625
5 3/4" DOVETAIL JAW P/N: 73014-05750	7 13/16" DOVETAIL JAW P/N: 73014-07812
6 1/4" DOVETAIL JAW P/N: 73014-06250	8" DOVETAIL JAW P/N: 86014-08000
	8 5/8" DOVETAIL JAW P/N: 86014-08625

NOT RECOMMENDED FOR USE WITH TOOL JOINTS SMALLER THAN 4 1/2" (NOMINAL T.J. OD). SMALL DIAMETERS REQUIRE *LOW FRICITON ROLLERS.

DRILL PIPE TONG DOVETAIL JAW ASSEMBLY

4 1/2" Assembly Number CJDT76-04500	5 3/4" Assembly Number CJDT76-05750	7 1/4" Assembly Number CJDT76-07250
4 5/8" Assembly Number CJDT76-04625	6 1/4" Assembly Number CJDT76-06250	7 1/2" Assembly Number CJDT76-07500
4 3/4" Assembly Number CJDT76-04750	6 3/8" Assembly Number CJDT76-06375	7 5/8" Assembly Number CJDT76-07625
4 7/8" Assembly Number CJDT76-04875	6 1/2" Assembly Number CJDT76-06500	7 13/16" Assembly Number CJDT76-07812
5" Assembly Number CJDT76-05000	6 5/8" Assembly Number CJDT76-06625	8" Assembly Number CJDT86-08000
5 1/4" Assembly Number CJDT76-05250	7" Assembly Number CJDT76-07000	8 5/8" Assembly Number CJDT86-08625
5 1/2" Assembly Number CJDT76-05500		

(Right & Left Jaw are reversible and interchangeable)

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		03/08/06
REV. #	LOG #	DATE

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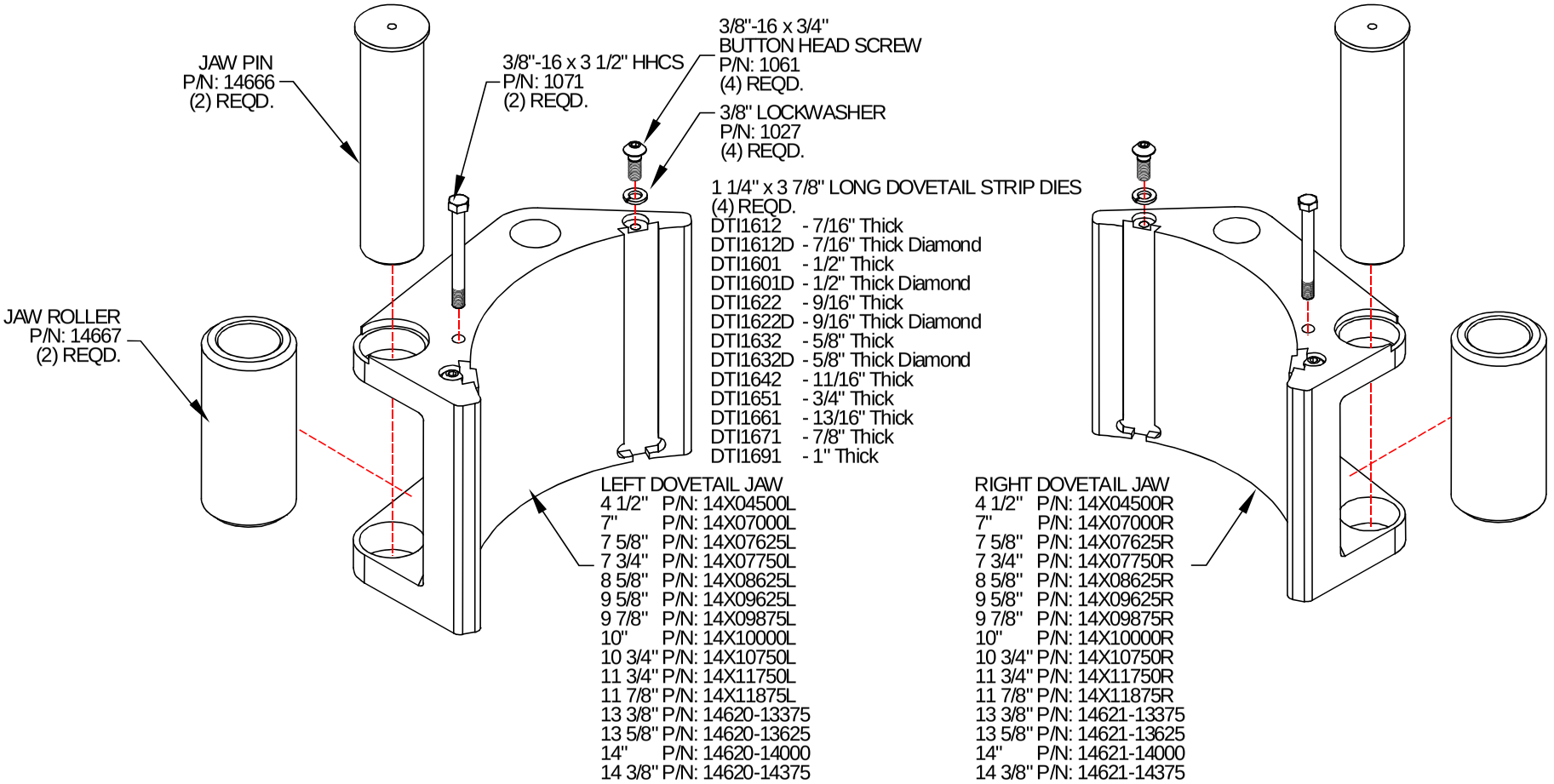

COMBINATION CASING/DRILL PIPE TONG
DOVETAIL JAW ASSEMBLY

4 1/2" Assembly Number CJDT14X04450
7" Assembly Number CJDT14X07000
7 5/8" Assembly Number CJDT14X07625
7 3/4" Assembly Number CJDT14X07750
8 5/8" Assembly Number CJDT14X08625
9 5/8" Assembly Number CJDT14X09625
9 7/8" Assembly Number CJDT14X09875
10" Assembly Number CJDT14X10000
10 3/4" Assembly Number CJDT14X10750
11 3/4" Assembly Number CJDT14X11750
11 7/8" Assembly Number CJDT14X11875
13 3/8" Assembly Number CJDT14X13375
13 5/8" Assembly Number CJDT14X13625
14" Assembly Number CJDT14X14000
14 3/8" Assembly Number CJDT14X14375

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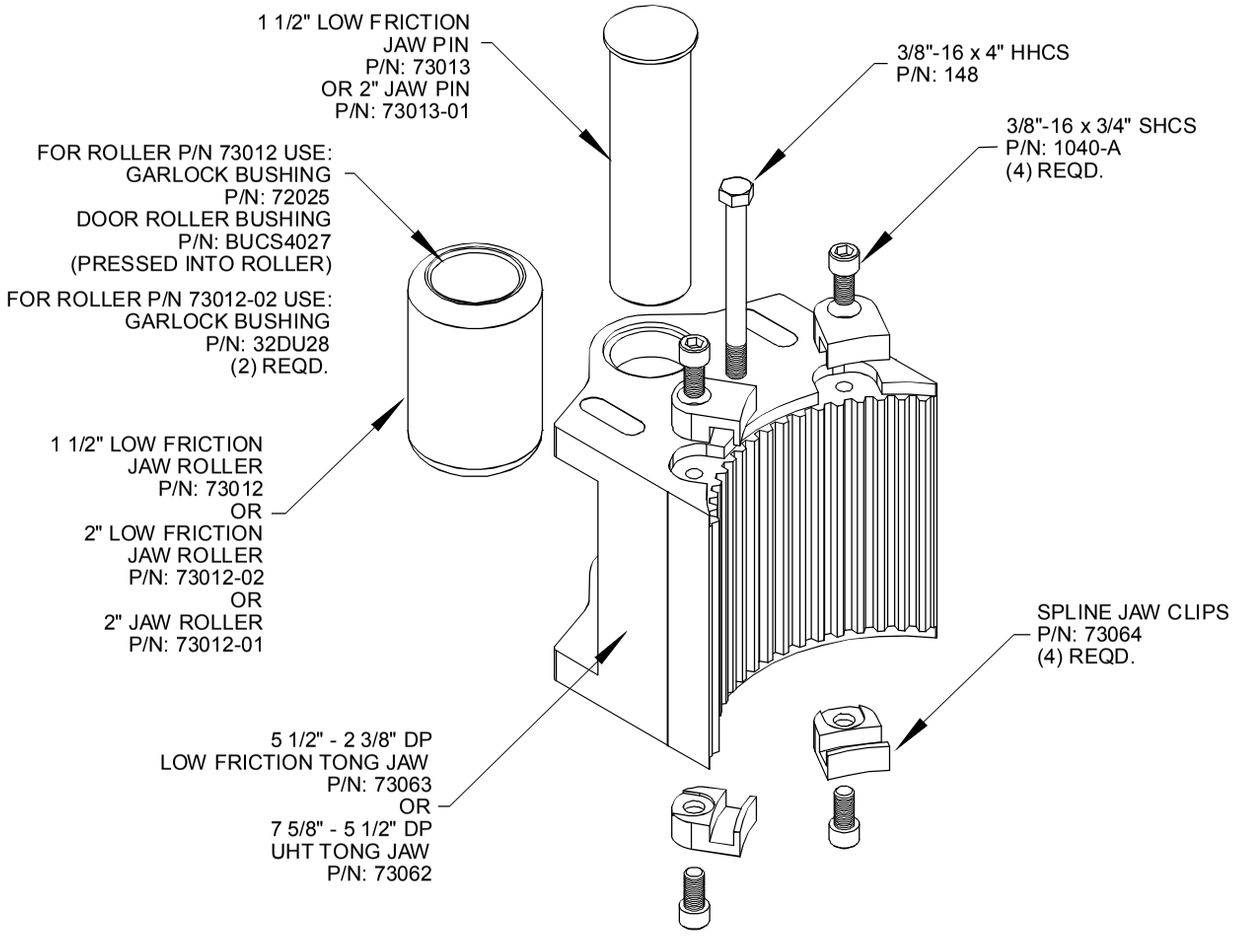
REV. #	LOG #	DATE
2		05/10/07

REF: P:\Manuals\Equip Manuals\Dwgs\CLE14000DPJaw DT 14 rev2.wpg



DRILL PIPE TONG

LOW FRICTION & SPLINED JAW ASSEMBLY

5 1/2" - 2 3/8" DP LF w/1 1/2" ROLLER Assembly Number CJ-LF-76D
5 1/2" - 2 3/8" DP LF w/2" ROLLER Assembly Number CJ-LF-76E
7 5/8" - 5 1/2" DP UHT Assembly Number CJ-76C

(2) Required
(Right & Left Jaw are reversible and interchangeable)

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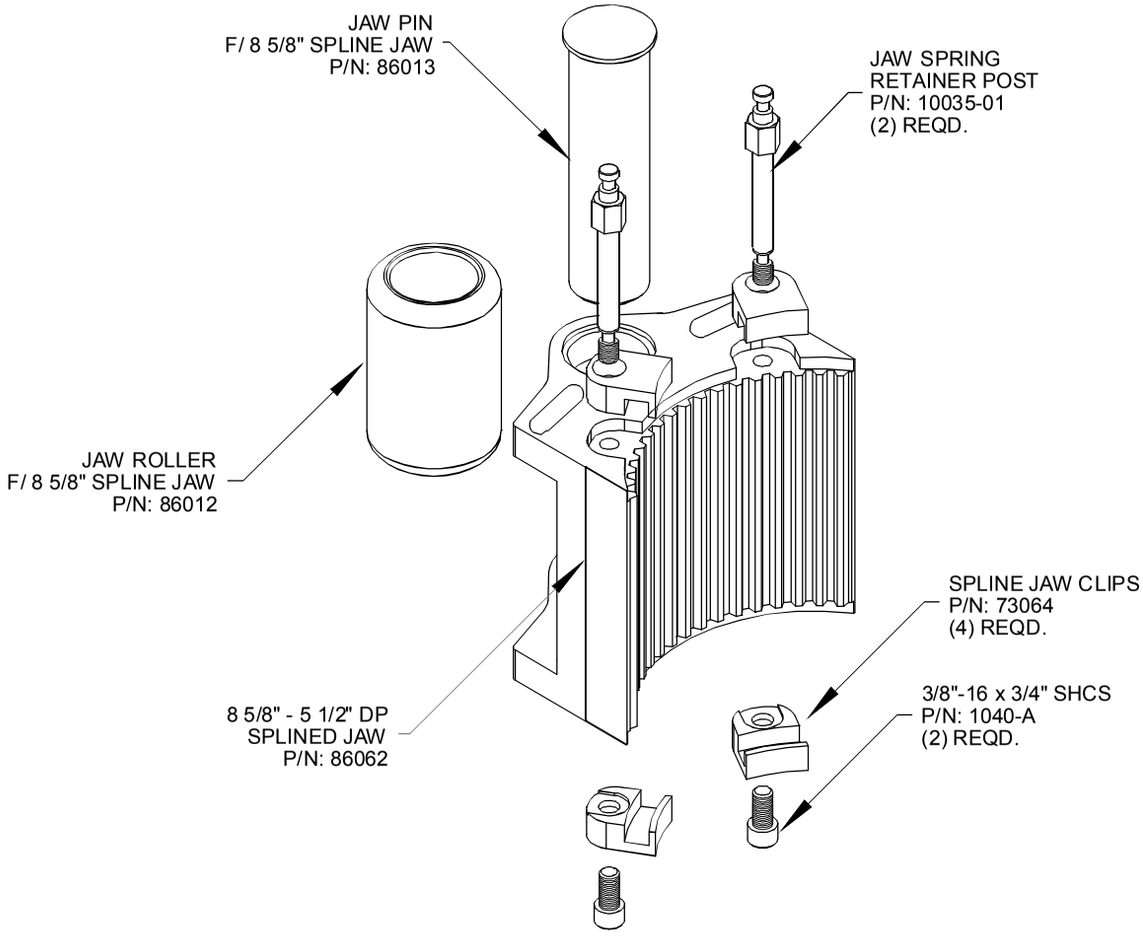
REV. #	LOG #	DATE
1		03/06/03

REF: S:\Equip Manuals-Dwgs\CLE8625DP\Jaw Assy rev1.wpg



DRILL PIPE TONG

SPLINED JAW ASSEMBLY

8 5/8" - 5 1/2" DP Assembly Number CJ-86A

(2) Required

(Right & Left Jaw are reversible and interchangeable)

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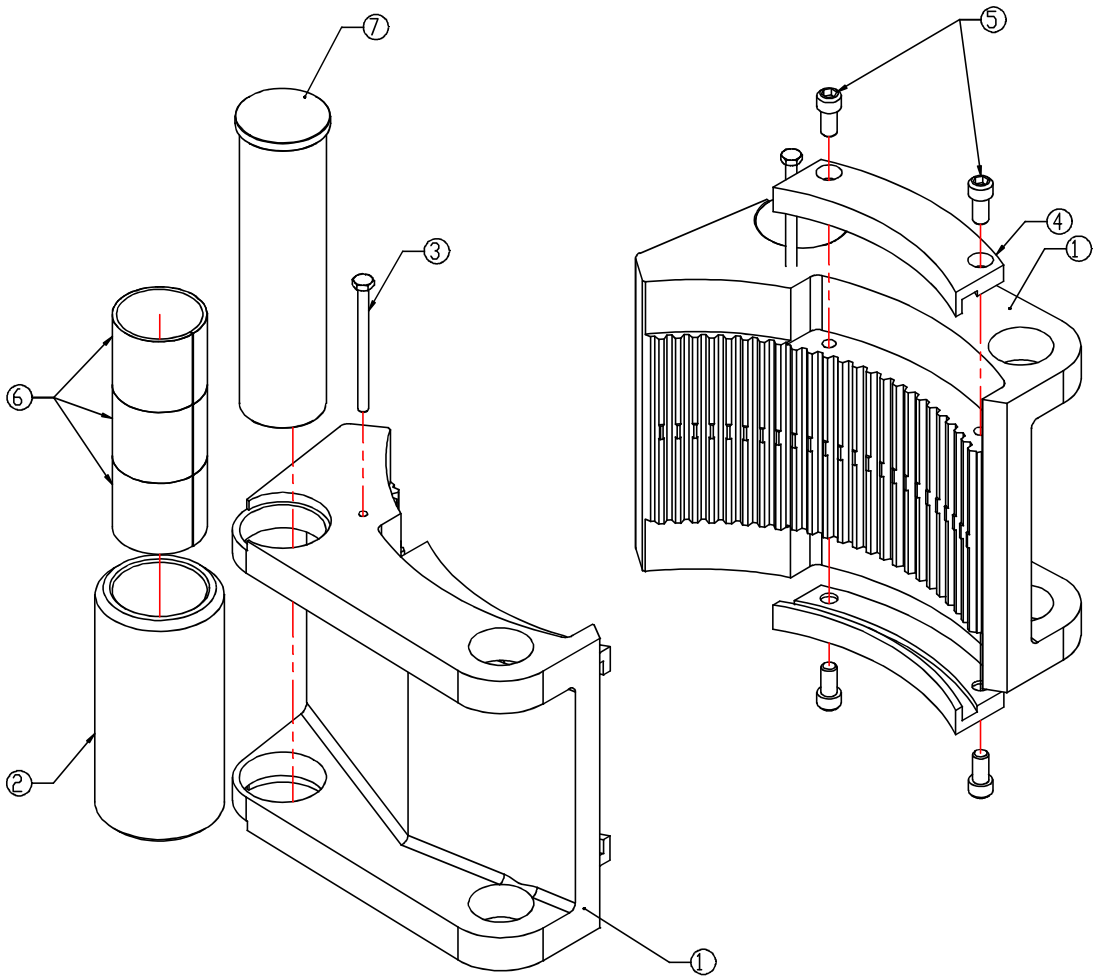
REV. #	LOG #	DATE
1		02/21/03

REF: S:\Equip Manuals-Dwgs\CLE8625DP\Jaw Assy 8625 rev1.wpg



Item #	Qty.	Part Number	Part Name
1	2	14631	14" X 11 3/4" LF SPLINED JAW
2	2	14667-02	JAW ROLLER
3	2	114	1/4"-20 X 3 1/2" HHCS GR8
4	4	clebu1121	DIE CLIP
5	8	1040-A	3/8-16 x 3/4 SHCS
6	6	32DU32	2" x 2" GARLOCK BUSHING
7	2	14666-02	JAW PIN △1

NOTE: USES BUCA1175-XXXX SERIES DIES

APPROX.WEIGHT (lbs.) = 102

Rev.#	By	Log#	Description of Revision
6			
5			
4			
3			
2			
1	RM	ECN06-0093	REPLACED 14666 WITH 14666-02

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE

2 PLACE DEC.	3 PLACE DEC.	FRACTIONS	ANGLES	SURFACE	FLATNESS AR PL.
±.020	±.005	± 1/16	± .5°	250	± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

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△1 1=Revision No. X=STAMP,ETCH,TAG ⊕=Machine Zero

.000 = Critical Dimension 100% Inspection Required

SUPERIOR Manufacturing & Hydraulics
4225 HWY.90 E
BROUSSARD, LA. 75018
PH# 337-837-8847
FAX: 337-837-8839

PART NAME: 14" X 11 3/4" LF SPLINED JAW SET

PART #: CJ-LF-14X

DRAWN BY: MARIA LANDRY

APPROVED BY: DSB CHK BY: NM

DATE: 6/27/2006

SHEET 1 of 1 1:4

MATERIAL SPECIFICATION

Mat'l.Req:

Initial Condition:

Alternate Mat'l:

HT Instructions: Case Depth:

P:\Manuals\Equip Manuals\Dwgs\CLE14000DP\Jaw CJ-LF-14X.wpg 05/10/07

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INSIDE DOOR ASSEMBLY *(Assembly No. BUCDP15015)* ..... 10 - 5
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DOVETAIL DIE ADAPTER..... 10 - 7
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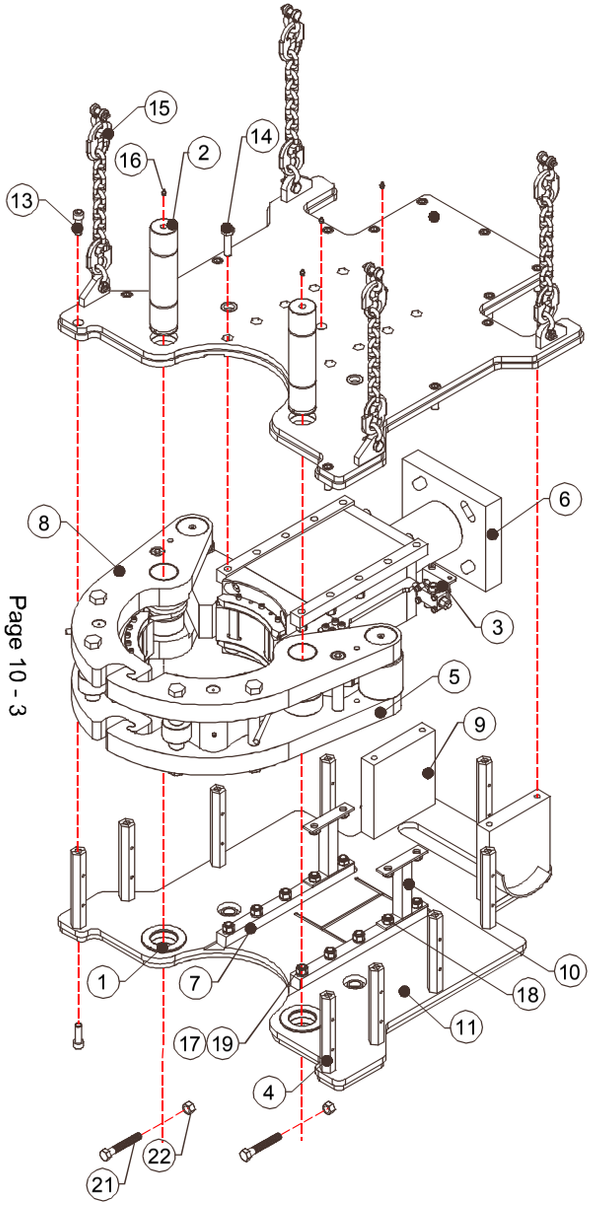
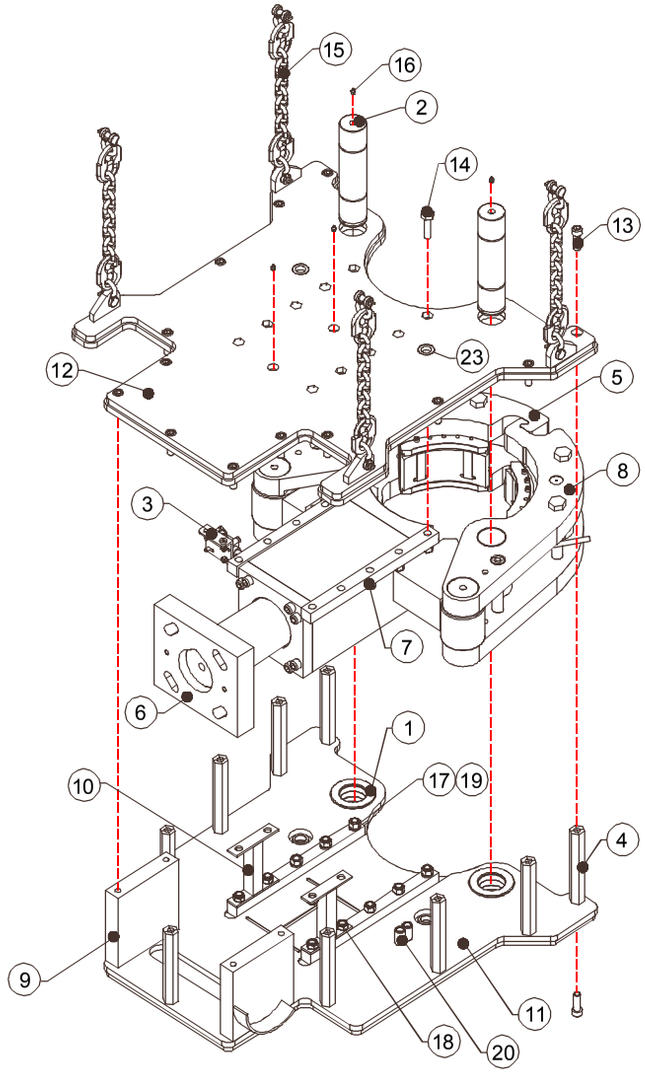
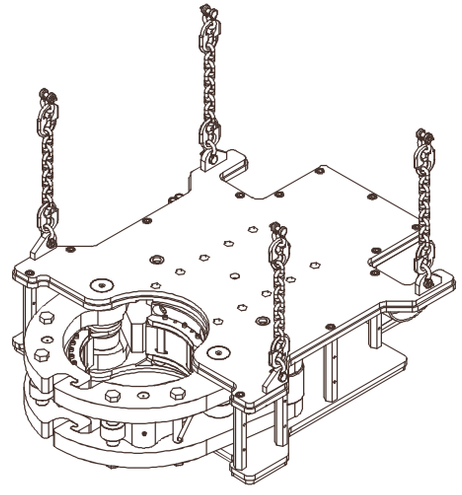




Item	Qty.	Part Number	Description
1	2	BUCDP9618	DOOR PIVOT BUSHING
2	2	BUCDP9621	BACKUP PIVOT PIN
3	1	BUCDP9640	HI-PSI CAM SWITCH VALVE ASSY.
4	9	BUCDP9648	BACKUP SPACER
5	1	BUCDP15005	OUTSIDE DOOR ASSEMBLY
6	1	BUCDP15006	CYLINDER ASSEMBLY
7	4	BUCDP15008	CYLINDER GUIDE
8	1	BUCDP15015	INSIDE DOOR ASSEMBLY
9	2	BUCDP15022	LOADCELL PLATE WELDMENT
10	2	BUCDP15034	COLUMN WELDMENT
11	1	BUCDP15052	BOTTOM PLATE WELDMENT
12	1	BUCDP15053	TOP PLATE WELDMENT
13	26	1277	3/4"-10 x 2 1/4" SHCS
14	20	1176	3/4"-10 x 3" HHCS
15	4	BUCT7636	SAFETY CHAIN ASSEMBLY
16	8	1001	1/8" NPT ZERT
17	12	283	3/4"-10 HEX NUT
18	8	1167	3/4"-10 NYLOCK NUT
19	12	1171	3/4" LOCKWASHER
20	2	1376	1/2" THREADED COUPLING
21	2	116	1/4"-20 x 4 1/2" HHCS
22	2	212	1/4"-20 NYLOCK NUT
23	4	1611	FLUSH PLUG 1" MNPT



15” DRILL PIPE BACKUP FOR HYTOPS™

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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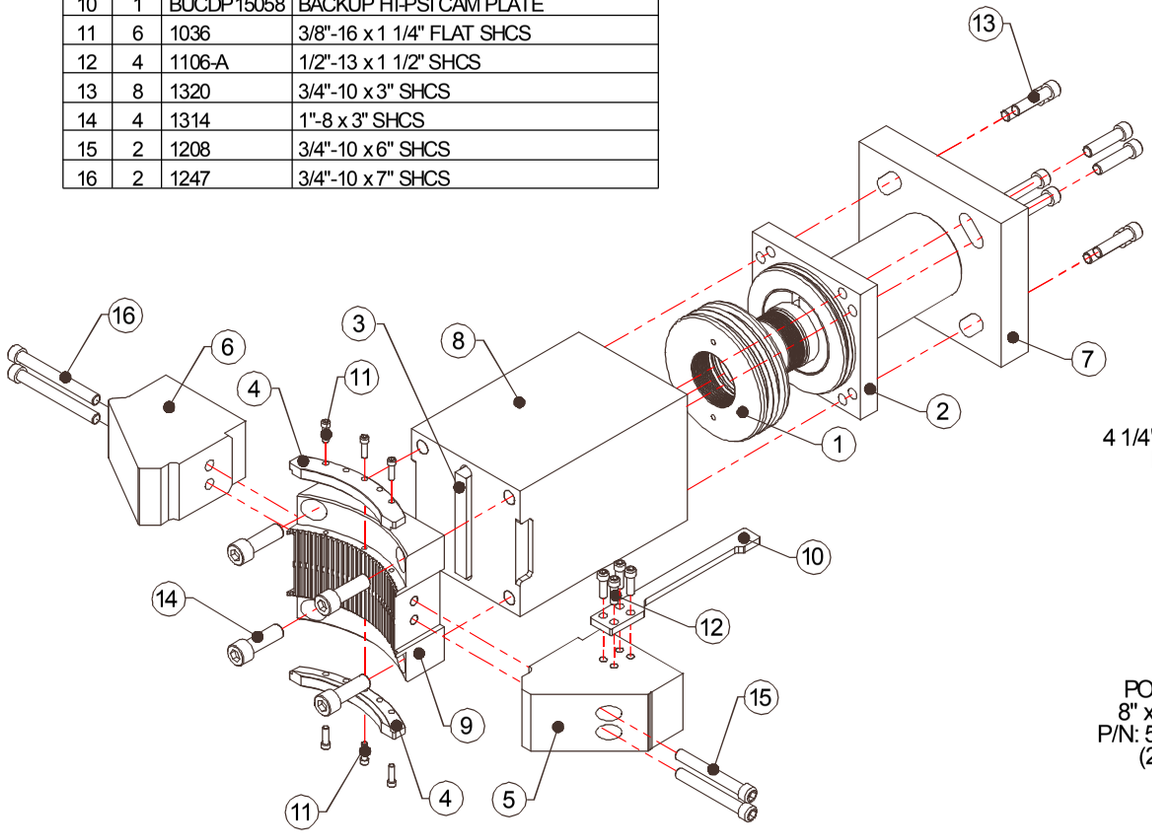
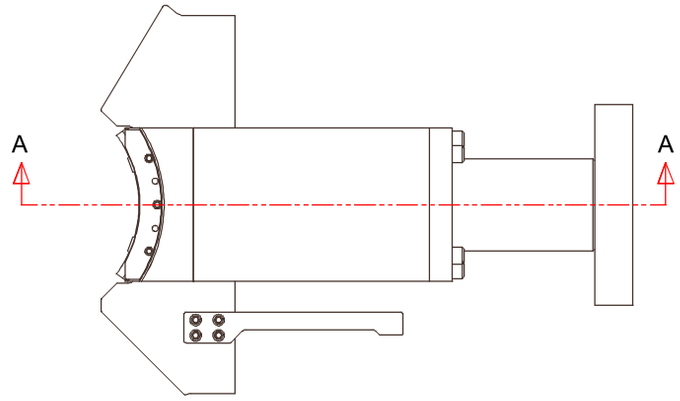
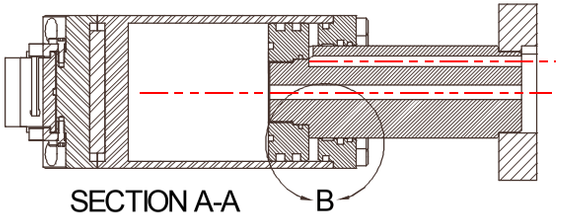
REV. #	LOG #	DATE
		04/16/03

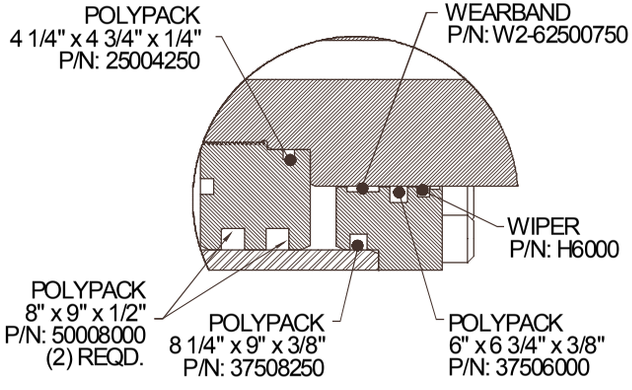
REF: S:\Equip Manuals\Dwgs\BUCDP15000\Assembly.wpg

Item	Qty.	Part Number	Description
1	1	BUCDP9604	PISTON
2	1	BUCDP9635	GLAND
3	1	BUCDP9636	CYLINDER KEY
4	2	BUCST1508	CLIP
5	1	BUCDP15017	OUTSIDE DOOR WEDGE
6	1	BUCDP15019	INSIDE DOOR WEDGE
7	1	BUCDP15027	ROD WELDMENT
8	1	BUCDP15032	CYLINDER
9	1	BUCDP15033	CYLINDER INSERT
10	1	BUCDP15058	BACKUP HI-PSI CAM PLATE
11	6	1036	3/8"-16 x 1 1/4" FLAT SHCS
12	4	1106-A	1/2"-13 x 1 1/2" SHCS
13	8	1320	3/4"-10 x 3" SHCS
14	4	1314	1"-8 x 3" SHCS
15	2	1208	3/4"-10 x 6" SHCS
16	2	1247	3/4"-10 x 7" SHCS









DETAIL B

SEAL KIT P/N: ASAP9625

CYLINDER ASSEMBLY

ASSEMBLY NO. BUCDP15006

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		04/21/03
REV. #	LOG #	DATE

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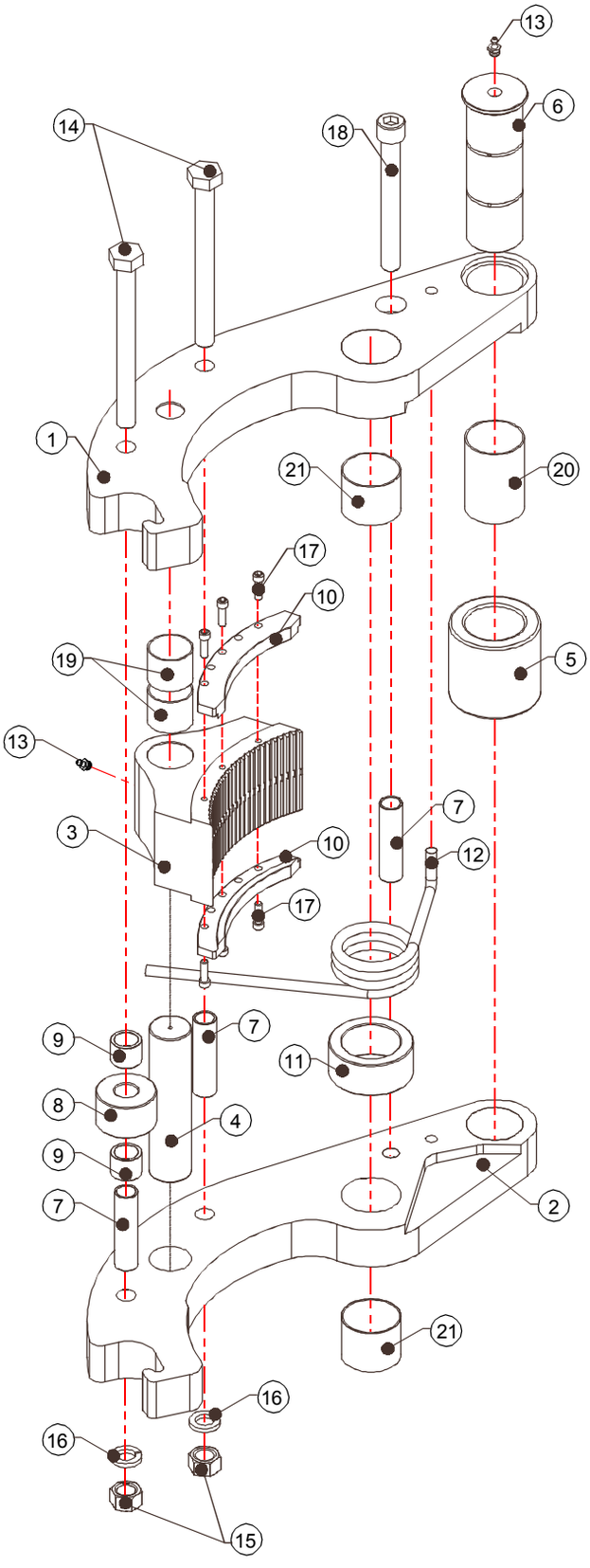
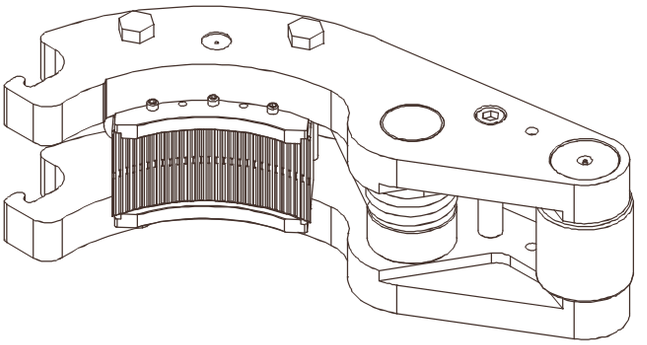


Item	Qty.	Part Number	Description
1	1	BUCDP15013	TOP INSIDE DOOR PLATE
2	1	BUCDP15012	BOTTOM INSIDE DOOR PLATE
3	1	BUCDP15020	CYLINDER INSERT
4	1	BUCDP9609	INSERT PIVOT PIN
5	1	BUCDP9610	DOOR ROLLER
6	1	BUCDP9611	DOOR ROLLER PIN
7	3	BUCDP9637	DOOR SPACER
8	1	BUCDP9651	PIVOTING INSERT SPRING
9	2	BUCDP9654	INSERT SPRING SPACER
10	2	BUCST1508	CLIP
11	1	BUCDP15035	DOOR SPRING SPACER
12	1	SMH1501-L	RIGHT HAND TORSION SPRING
13	2	1001	1/8" NPT ZERT
14	2	1316	1"-8 x 10 1/2" HHCS
15	2	1210	1"-8 HEX NUT
16	2	1218	1" LOCKWASHER
17	6	1036	3/8"-16 x 1 1/4" FLAT SHCS
18	1	1326	1"-8 x 8 1/2" SHCS
19	2	36DU32	GARLOCK BUSHING
20	1	48DU72	GARLOCK BUSHING
21	2	48DU40	GARLOCK BUSHING



INSIDE DOOR ASSEMBLY

ASSEMBLY NO. BUCDP15015

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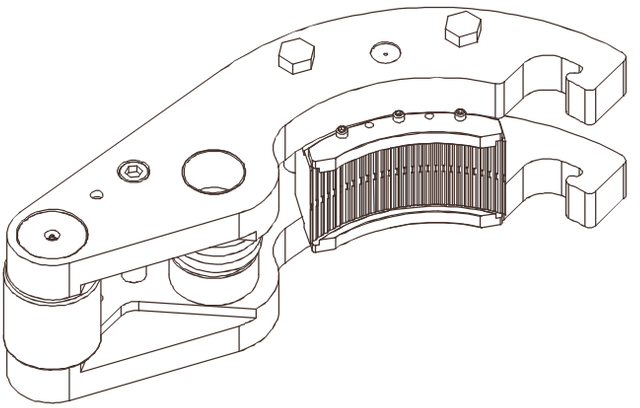
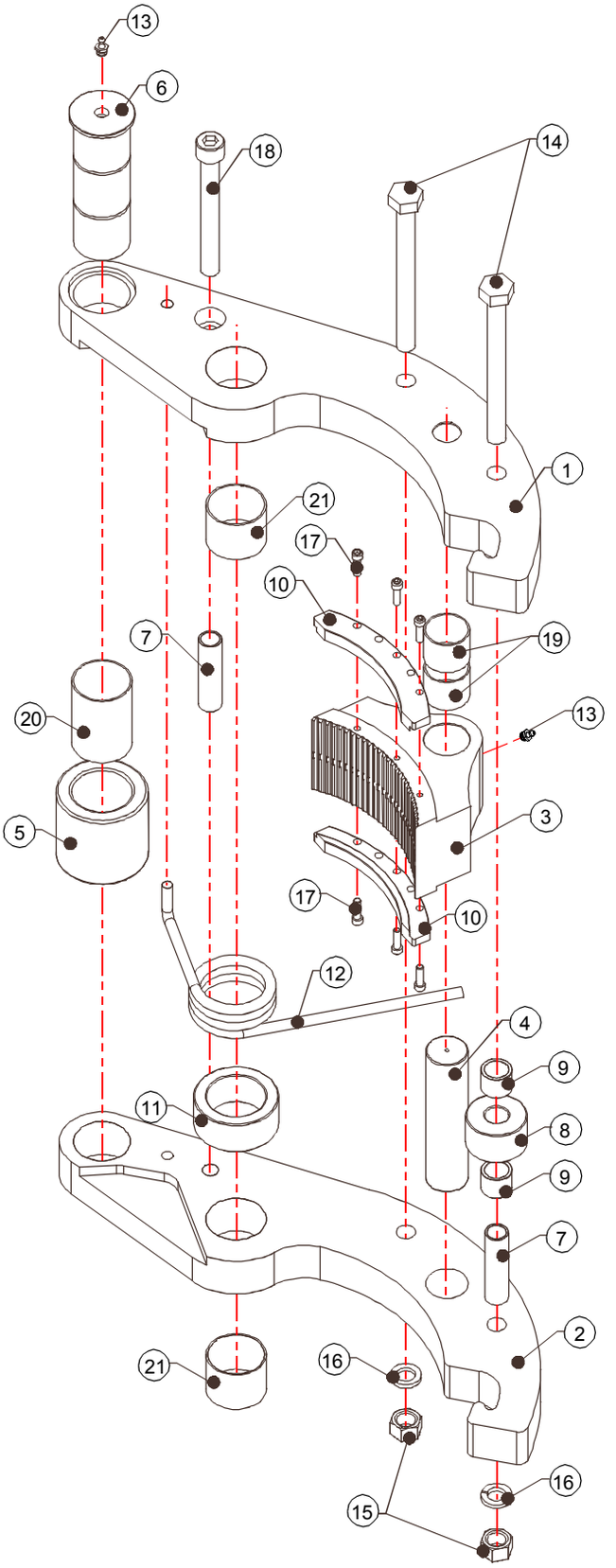
		03/30/09
REV. #	LOG #	DATE

Item	Qty.	Part Number	Description
1	1	BUCDP15003	TOP OUTSIDE DOOR PLATE
2	1	BUCDP15007	BOTTOM OUTSIDE DOOR PLATE
3	1	BUCDP15020	CYLINDER INSERT
4	1	BUCDP9609	INSERT PIVOT PIN
5	1	BUCDP9610	DOOR ROLLER
6	1	BUCDP9611	DOOR ROLLER PIN
7	3	BUCDP9637	DOOR SPACER
8	1	BUCDP9651	PIVOTING INSERT SPRING
9	2	BUCDP9654	INSERT SPRING SPACER
10	2	BUCST1508	CLIP
11	1	BUCDP15035	DOOR SPRING SPACER
12	1	SMH1501-L	LEFT HAND TORSION SPRING
13	2	1001	1/8" NPT ZERT
14	2	1316	1"-8 x 10 1/2" HHCS
15	2	1210	1"-8 HEX NUT
16	2	1218	1" LOCKWASHER
17	6	1036	3/8"-16 x 1 1/4" FLAT SHCS
18	1	1326	1"-8 x 8 1/2" SHCS
19	2	36DU32	GARLOCK BUSHING
20	1	48DU72	GARLOCK BUSHING
21	2	48DU40	GARLOCK BUSHING





OUTSIDE DOOR ASSEMBLY

ASSEMBLY NO. BUCDP15005

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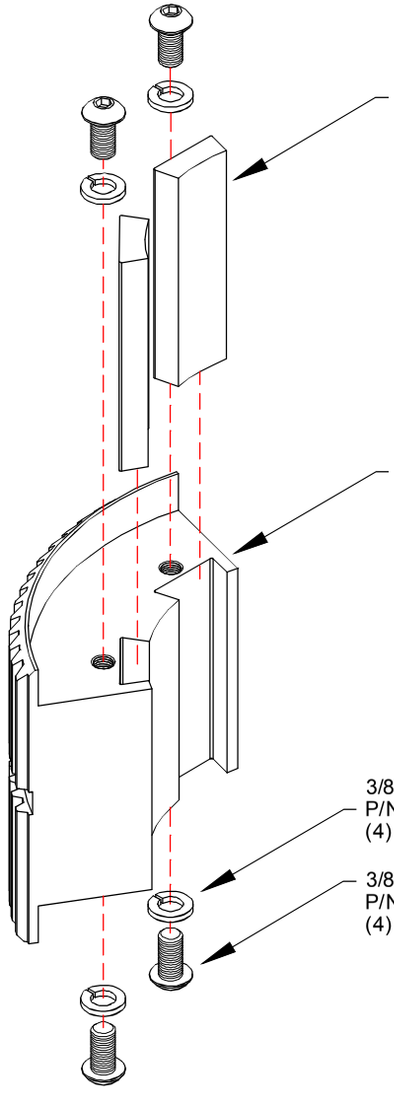
		04/21/03
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\BUCDP15000\Door Outside.wpg



1 1/4" x 3 7/8" DOVETAIL STRIP DIES
DT11601 - 1/2" Thick
DT11601D - 1/2" Thick Diamond
DT11622 - 9/16" Thick
DT11632 - 5/8" Thick
DT11642 - 11/16" Thick
DT11661 - 13/16" Thick
DT11662 - 1 1/4" Thick

DOVETAIL DIE ADAPTERS

BUDT15-07000	7"	BUDT15-12750	12 3/4"
BUDT15-09625	9 5/8"	BUDT15-13375	13 3/8"
BUDT15-09875	9 7/8"	BUDT15-13625	13 5/8"
BUDT15-10625	10 5/8"	BUDT15-14000	14"
BUDT15-10650	10.065"	BUDT15-14375	14 3/8"
BUDT15-10750	10 3/4"	BUDT15-14398	14.398"
BUDT15-11750	11 3/4"	BUDT15-15000	15"
BUDT15-11875	11 7/8"		

3/8" LOCKWASHER
P/N: 134
(4) REQD.

3/8"-16 x 3/4" BUTTON HEAD CSX
P/N: 1061
(4) REQD.

15" LOCKJAW™ DRILL PIPE BACKUP

DOVETAIL DIE ADAPTER

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		02/21/03
REV. #	LOG #	DATE

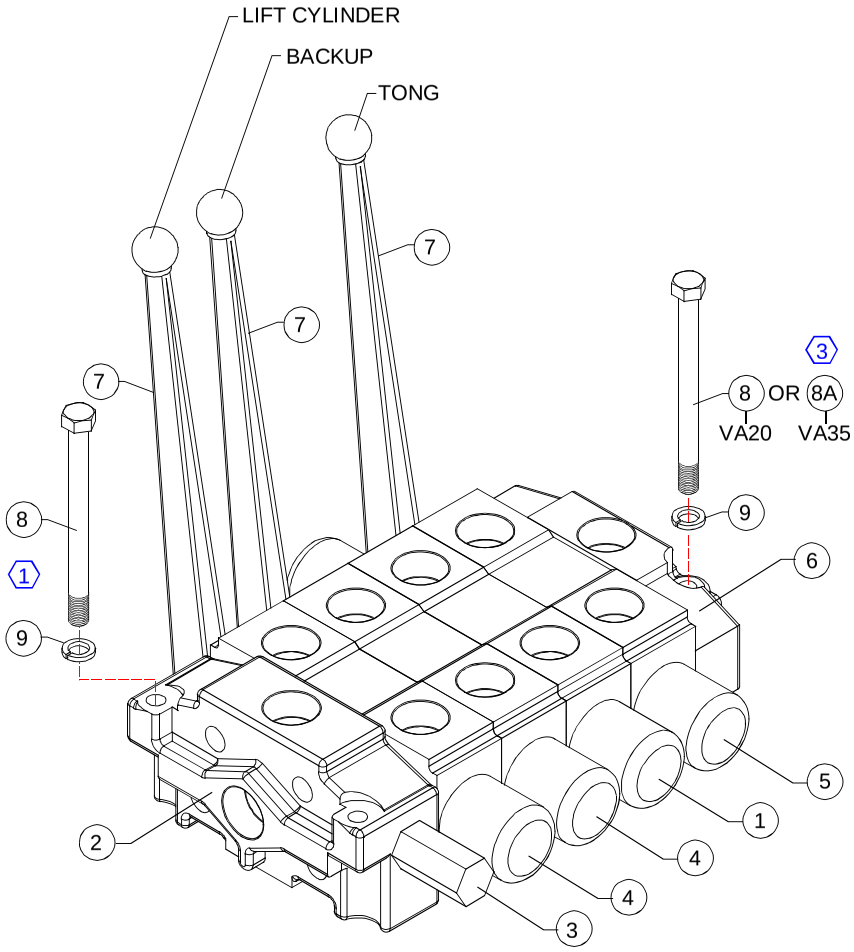
REF: S:\Equip Manuals-Dwgs\BUCS15000\Die Adapter DT.wpg

A20 VALVE BANK ASSEMBLY

Item #	Qty.	Part Number	Description
1	1	55201	CONTROL VALVE ASSEMBLY - MODIFIED VA20-WDA3
			BEFORE 04/15/04
2 OR	1	VA20-MOD	WORK SECTION
			AFTER 04/15/04
2	1	VA20-AA440	INLET VALVE W/O RELIEF
3	1	VA20-MRV-1	RELIEF CARTRIDGE
4	2	VA20-DA3	WORK SECTION
5	1	VA20-MA3	WORK SECTION
6	1	VA20-TR44	OUTLET SECTION
7	3	A20-V1526K-8	A20 8" HANDLE
1 8	3	1072	HHCS 3/8"-16 x 3 3/4" (COMPONENT OF KIT P/N: 4 BANK)
1 9	3	134	LOCKWASHER 3/8" (COMPONENT OF KIT P/N: 4 BANK)

A35 VALVE BANK ASSEMBLY

Item #	Qty.	Part Number	Description
1	1	14213	CONTROL VALVE ASSEMBLY - MODIFIED VA35-WDA4
			BEFORE 04/15/04
2 OR	1	VA35-MOD	WORK SECTION
			AFTER 04/15/04
2	1	VA35-AA440	INLET VALVE W/O RELIEF
3	1	DVG35-HMRV 4	RELIEF CARTRIDGE
4	2	VA35-DA4	WORK SECTION
5	1	VA35-MA4	WORK SECTION
6	1	VA35-TR55	OUTLET SECTION
7	3	A35-V1526K-8	A35 8" HANDLE
1 8	2	X2-40 3	HHCS 1/2"-13 x 4 1/4" 3
3 8A	1	X2-45	HHCS 1/2"-13 x 4 1/2"
1 9 3	3	1103	LOCKWASHER 1/2"



VALVE BANK ASSEMBLY

Rev.	Date	Description
4	08/19/05	Item 3 - Chg.PN from A35-MRV-1 to DVG35-HMRV; ECN#05-0064.
3	12/13/04	Item 8 - Chg. Length from 5" to 4 1/4", PN from X2-79 to X2-40.
		Item 8A - Added Part. Item 9 - Chg. Qty. from 2 to 3.
2	10/21/04	Item 1 - Added VA20-MOD & VA35-MOD for Production after 04/15/04.
1	06/10/02	Item 8 & 9 - Added Part.

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REV. #	LOG #	DATE
4		08/19/05

REF: S:\Equip Manuals\Dwgs\Valve Bank 4 rev4.wpg

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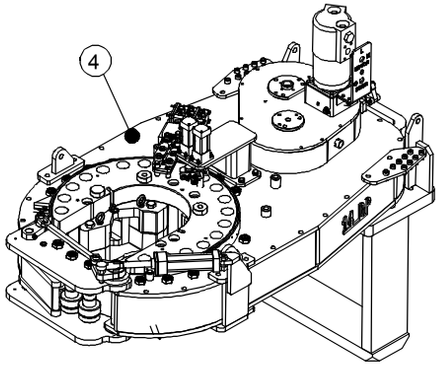
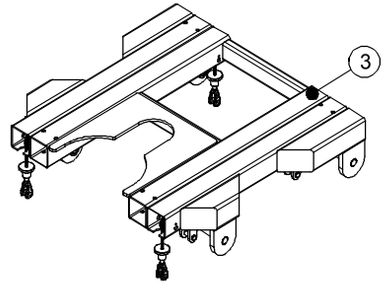
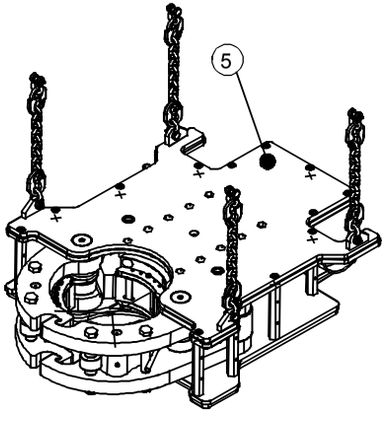
15" **HYTOPS™** ASSEMBLY *(Assy. No. HYTOPS15000)*..... 11 - 3

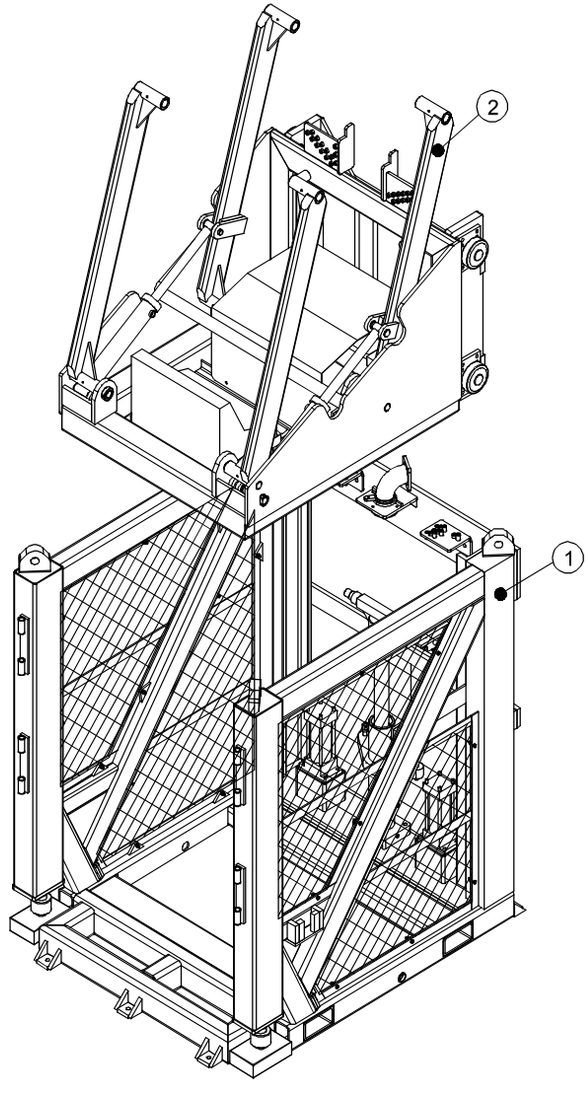
THESE ILLUSTRATIONS ARE NOT PRESENTLY AVAILABLE
WILL DISTRIBUTE WHEN COMPLETE

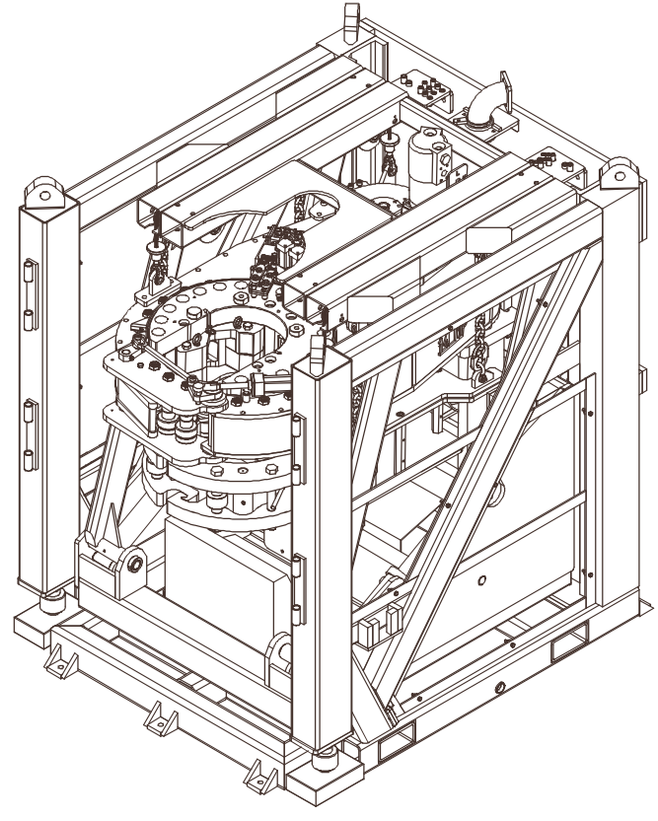
MAIN FRAME ASSEMBLY *(Assy. No. 15002)* ..... 11 - 4
VERTICAL CARRIAGE ASSEMBLY *(Assy. No. HTS15004) (Sht 1)*..... 11 - 5
VERTICAL CARRIAGE ASSEMBLY *(Assy. No. HTS15004) (Sht 2)*..... 11 - 6
SPRING HOUSING ASSEMBLY *(Assy. No. HTS15005)* ..... 11 - 7











Item #	Qty.	Part Number	Description
1	1	HTS15002	MAIN FRAME ASSEMBLY
2	1	HTS15004	VERTICAL CARRIAGE ASSEMBLY
3	1	HTS15008-02	HANGER ASSEMBLY
TONG & BACKUP SIZE WILL VARY WITH CUSTOMER APPLICATION			
4	1	CLE14000DP-01	14" REMOTE DRILL PIPE TONG
5	1	BUCDP15000	15" DRILL PIPE BACKUP

HYTOPS15000 ASSEMBLY

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		04/21/03

REF: S:\Equip Manuals\Dwgs\HYTOPS15000\Assembly.wpg

SECTION 12 15" HYTOPS™
CONTROL PANEL ILLUSTRATIONS

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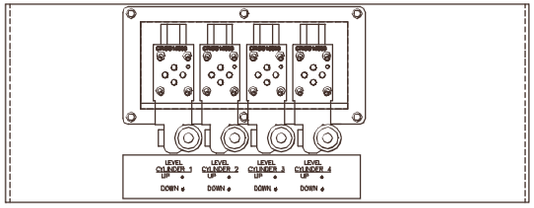
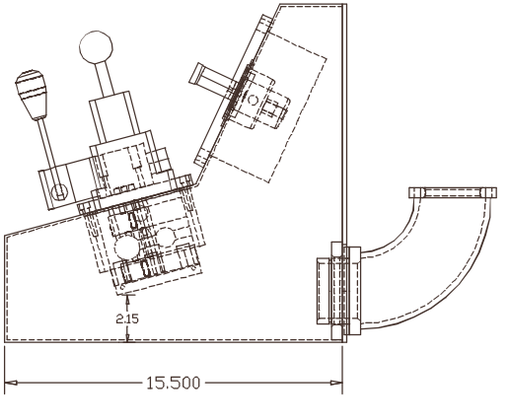
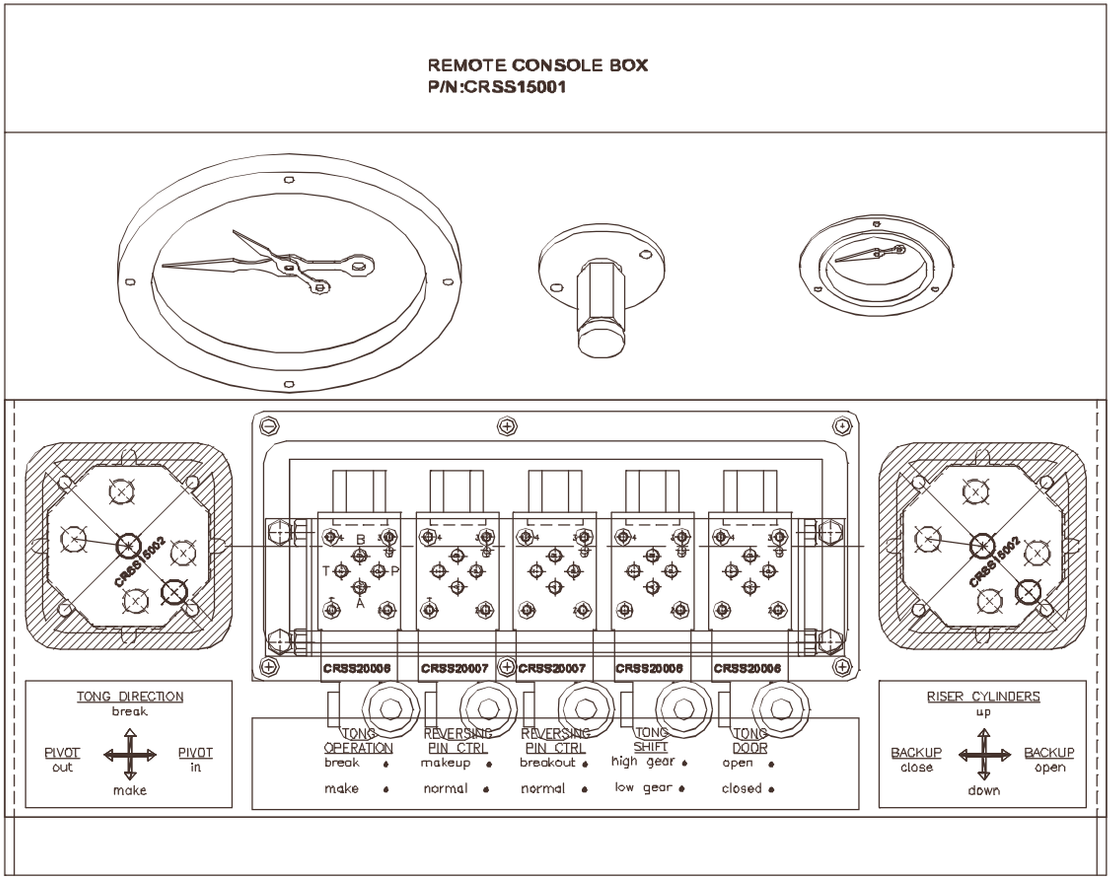
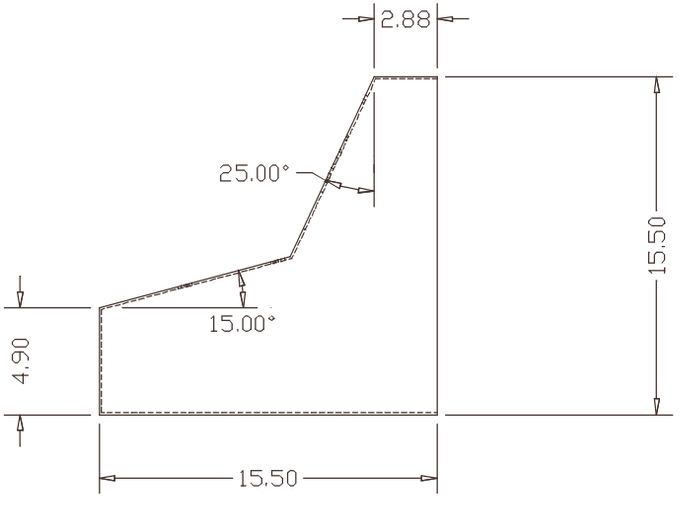
SCHEMATIC COMPONENTS LIST..... 12 - 6



REMOTE CONSOLE ASSEMBLY
P/N:CRSS15000







CONSOLE CRSS15000

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REV. #	LOG #	DATE
		04/22/03

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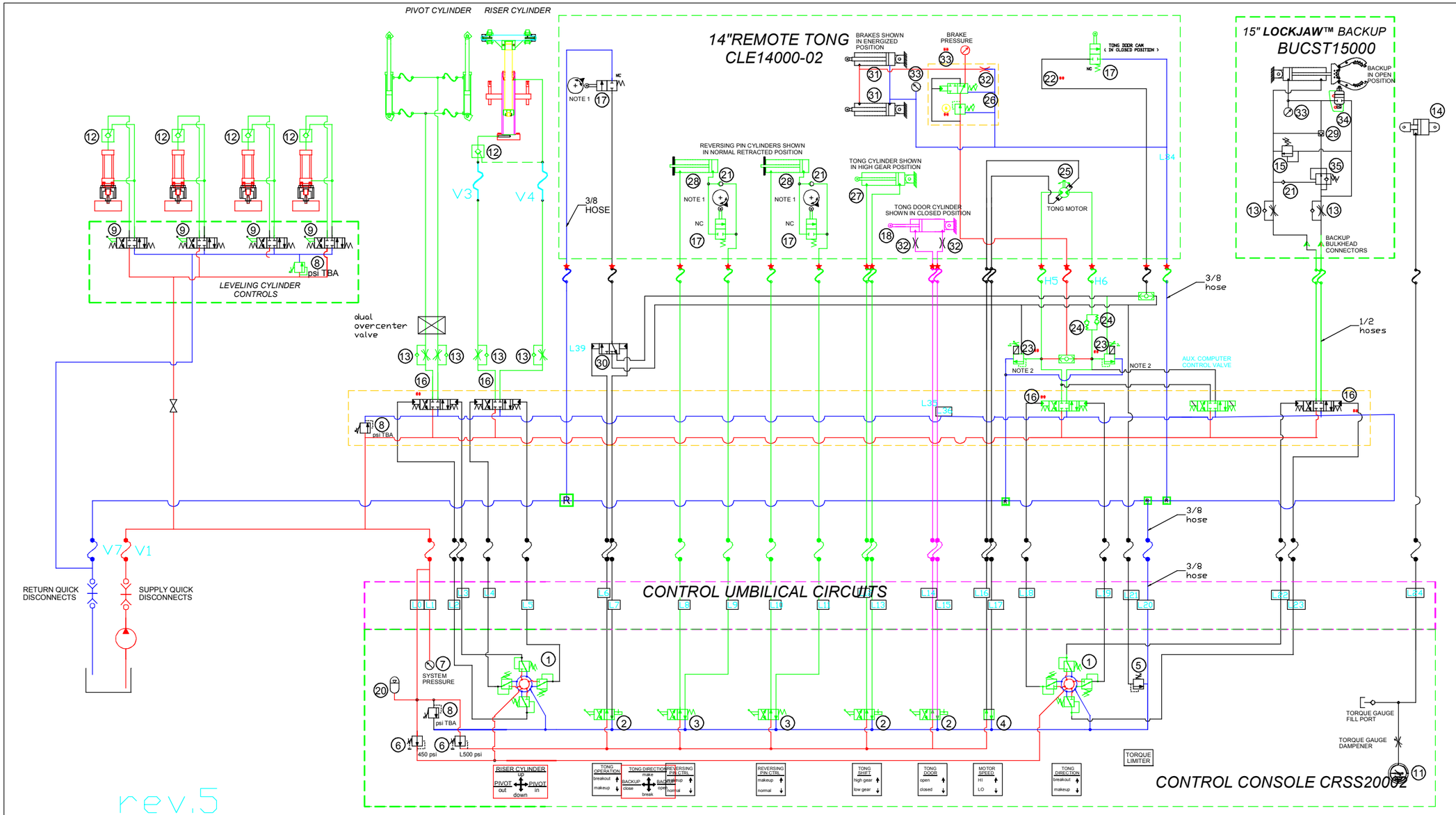

NOTES

NOTE 1: Cam valve shown in normal position ie. Tong is NOT in open throat position.

NOTE 2: (Item 23) Dump valve is available w/ optional electric solenoid actuator.

LEGEND

- P — SUPPLY MANIFOLD
- R — RETURN MANIFOLD
- BACKUP BULKHEAD CONNECTORS
- TONG BULKHEAD CONNECTORS
- (14) ITEM NUMBERS
- ## Indicates component is physiclly located on Suspension Frame or Backup top plate.
- L1 CONTROL UMBILICAL CIRCUIT NUMBERS L0-L24
- H1 MOVABLE HYDRAULIC HOSE moves along w/ major Components H1-H7

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PART NAME: HYDRAULIC SCHEMATIC DIAGRAM FOR HYTOPS15000

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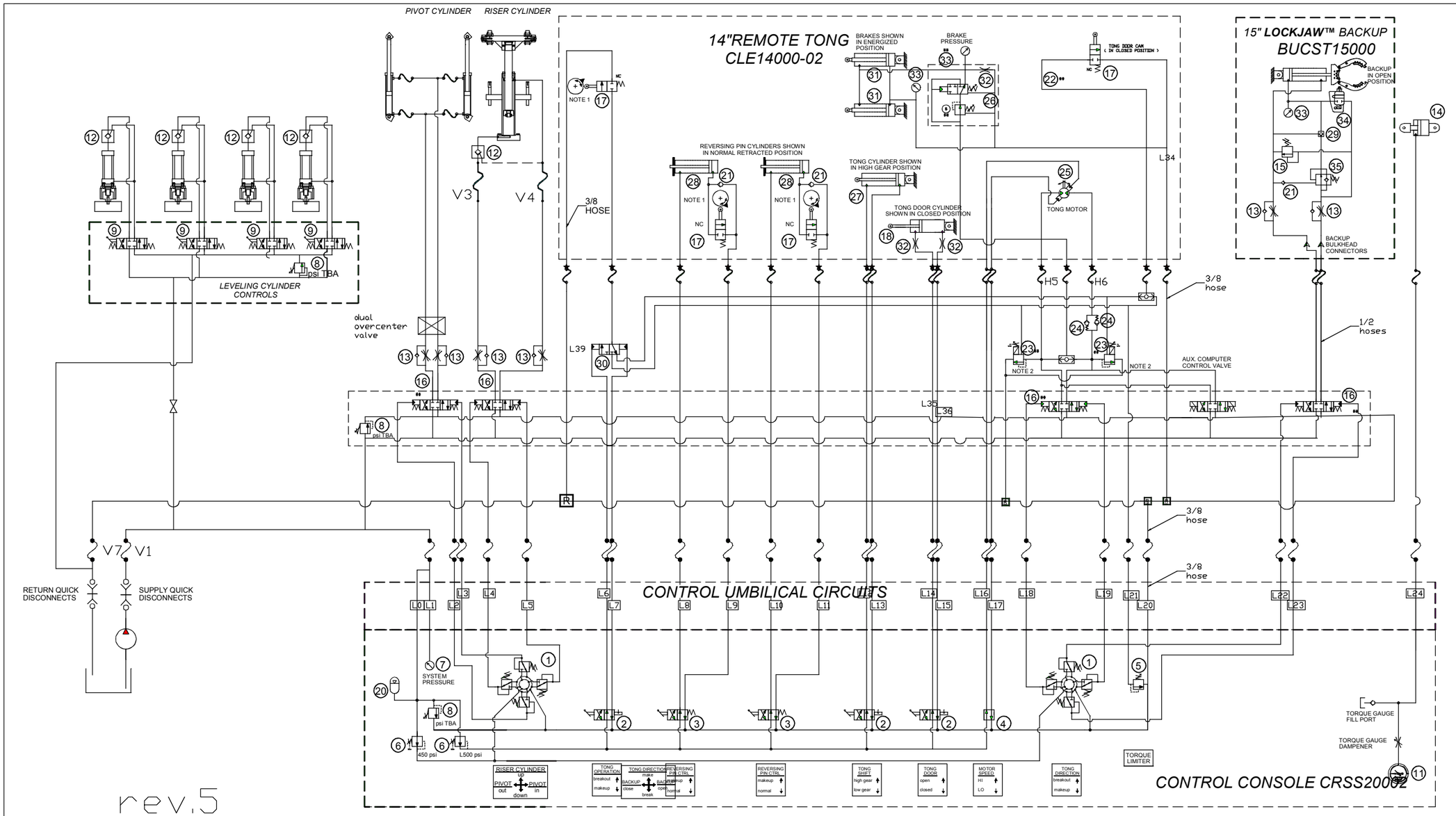
PART #:	
DRAWN BY: Ning Malathong	
APPROVED BY: Dan Bangert	
CHK BY: NM	DATE: Feb. 2, 2000
REF: F:\manuals\hytops15000\hytops15000_schematic1	



rev.5

LEGEND

- P — SUPPLY MANIFOLD
- R — RETURN MANIFOLD
- BACKUP BULKHEAD CONNECTORS
- TONG BULKHEAD CONNECTORS
- (14) ITEM NUMBERS
- L1 — CONTROL UMBILICAL CIRCUIT NUMBERS L0-L24
- H1 — MOVABLE HYDRAULIC HOSE moves along w/ major Components H1-H7
- ## Indicates component is physicly located on Suspension Frame or Backup top plate.

NOTES

NOTE 1: Cam valve shown in normal position ie. Tong is NOT in open throat position.

NOTE 2: (Item 23) Dump valve is available w/ optional electric solenoid actuator.

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PART NAME: HYDRAULIC SCHEMATIC DIAGRAM FOR HYTOPS15000

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PART #:
DRAWN BY: Ning Malathong
APPROVED BY: Dan Bangert
CHK BY: NM DATE: Feb. 2, 2000
REF: F:\manuals\hytops15000\hytops15000_schematic1

14/15 TONG/BACKUP SYSTEM HYDRAULIC SCHEMATIC COMPONENTS

ITEM	*PART NO.*	*DESCRIPTION*	*QTY.*	*LOCATION*
1	CRSS15002	COMMERCIAL INTERTECH Dual Function Joystick Valve PN:(361-9171-304/DVHRC-DDM)	2	Console
2	CRSS20006	BOSCH 2 pos. Detent / 4-way DO3 Valve, Lever operated, 4600 PSI Max, 23 GPM Max PN:(0810091388)	3	Console
3	CRSS20007	BOSCH 2 pos. Spring Ret./ 4-way DO3 Valve, Lever operated, 4600 PSI Max, 23 GPM Max P/N:(0810091389)	2	Console
4	73028	WHITEY 4-Way Ball Valve (Hi/Lo Valve) SS-43YF2	1	Console
5	CRSS20009	DYNEX Remotely Operated Relief Valve, Panel Mount PN:(8820-01-1/4-21)	1	Console
6	42054	DANFOSS- Pressure Reducing Valve	2	Console
7	BAC-5M25RCFF	Gauge 0-5000 psi	1	Console
8	CRSS20011	STERLING Relief Cartridge P/N:(A04G2HZN)	3	**HYTOPS™**, Main Frame, Console
9	CRSS15003	BOSCH 3 pos. Closed Cent./ 4-way DO3 Valve, Lever operated, 4600 PSI Max, 23 GPM Max PN:(0810091381)	4	Main Frame
10	- - - - -	- - - - -	- - -	- - - - -
11	SM120-44-CG	44 5/8" Handle x 120,000 ft.lbs. Torque Gauge w/ Dampener & Fill Port	1	
12	HTS15025	DANFOSS P.O. Check Valve 4K401-N3-SV	5	**HYTOPS™**
13	CLEBU1664	1/2" Adjustable Flow Control w/ Integrated Free Flow Return Check Valve F800S	6	4- **HYTOPS™**, 2- Backup
14	SM120-44-C	Load cell 25 Sq.In. 44 5/8" Handle, 120,000 ft.lbs.	1	
15	CRSS20016	SUN Relief Valve PN:(RPEC-LDN-FAA)	1	Backup
16	CRSS20017	GRESEN Remote Valve f/ Backup Cylinder P/N:(V50-F4-04-NR-C-HRO	4	**HYTOPS™**
17	SLV1000-01	NC Self Lubricated Valve	4	Tong
18	82080-02	Tong Door Cylinder	1	Tong
19	- - - - -	- - - - -	- - -	- - - - -
20	HTS15017	6 Cu.In. Accumulator AM6	1	Console
21	CM4554	Check Valve 3/8 NPT	3	1-Backup, 2-Tong
22	CRSS20021	Shuttle Valve 1/4 NPT	1	Tong
23	2070	DENISON Dump Valve (Solenoid Option) PN:(R4V10-5A9-10A1	2	**HYTOPS™**
24	58099	DMIC High Pressure Check Valve PN:(CVH145-1000N)	2	**HYTOPS™**
25	73099	RINEER Motor 015-65-021-31-71	1	Tong
26	CRSS20019	SUN 2 pos. Spring Ret./ 3-way Pilot Operated Directional Control Valve PN:(DPBMLBN MAB)	1	Tong (f/Brake)
27	2047	Auto Shift Cylinder	1	Tong
28	13606	Reversing Pin Cylinders	2	Tong
29	BUC5524	SUN Pilot Operated Check Valve 5000 psi PN: CKEB LBN BCCS	1	Backup
30	VS4BUB7F-HD	CROSS Pilot Operated Diversion Valve PN:128341	1	**HYTOPS™**
31	2019	Brake Cylinders	2	Tong
32	58100	Fixed Orifice	3	Tong
33	1650	0-3000 psi Gauge P/N:(BAC-3M-25)	3	1-Backup, 2-Tong
34	SLV1000-04	NC Orig. Spool Self Lubricated Valve w/Vent	1	Backup
35	CM7654	SUN Pressure Reducing Valve set @ low psi w/ Integrated Free Flow Return Check Valve PN: YPDA-KAN-BB	1	Backup

SUPERIOR MANUFACTURING

Pick List

CRSS15000 / REMOTE CONSOLE ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1006	ROLL PIN 3/16" X 1"	each	50	1	_____
1150-A	BRASS NUT 6-32"	each	51	3	_____
1150-B	BOLT BRASS 6-32" X 3/4"	each	51	3	_____
1927-A	SNAP RING EXT. RSN-300	each	S5-E	2	_____
2-012	O RING 3/8"ID 1/2"OD 1/16"WIDTH	each	O2-A	20	_____
42054	PSI REDUCING VALVE (DANFOSS) CART. 1PA10-F-30SV ; BODY 982050-U	each	M3-E	2	_____
73028	4-WAY BALL VALVE	each	M8-E	1	_____
BAC-5M25RCFF	GAUGE, 0-5000 PSI 2 1/2" 1/4 NPT PANEL MT.	each	S2-E	1	_____
BUCS2163	HOSE BUNDLE SWIVEL WELD F/ CONTROL CONSOLE F/ 20" PICKLIST	each		2	_____
BUCS2173	SUSPENSION END SWIVEL SPACER	each		2	_____
CRSS10010	(5) BANK DO3 ALUM. MANIFOLD DAMAN- P/N:A-DO3-P-05-02-S/C	each		1	_____
CRSS15001	REMOTE CONSOLE BOX F/ HYTOPS15000	each		1	_____
CRSS15002	DUAL FUNCTION JOYSTICK VALVE3 Commercial Intertech 361-9171-304/DVHRC-DDM	each	M18-D	2	_____
CRSS15005	(5) BANK ALUMINUM SUB PLATE F/ HYTOPS15000	each		1	_____
CRSS15006	OBSOLETE-NOT REQUIRED (4) BANK ALUMINUM SUB PLATE F/ HYTOPS15000	each		1	_____
CRSS15007	LABEL SET F/ HYTOPS15000	each		1	_____
CRSS20006	2-pos, Detent./4-way DO3, Lever op, 4600 psi max 23gpm BOSCH- P/N:0810091388	each	M18-F	3	_____
CRSS20007	2-pos, Spr.Cent./4-way DO3, Lever op, 4600 psi max 23gpm BOSCH- P/N:0810091389	each	M18-F	2	_____

SUPERIOR MANUFACTURING

Pick List

CRSS15000 / REMOTE CONSOLE ASSEMBLY

Quantity to build: 1

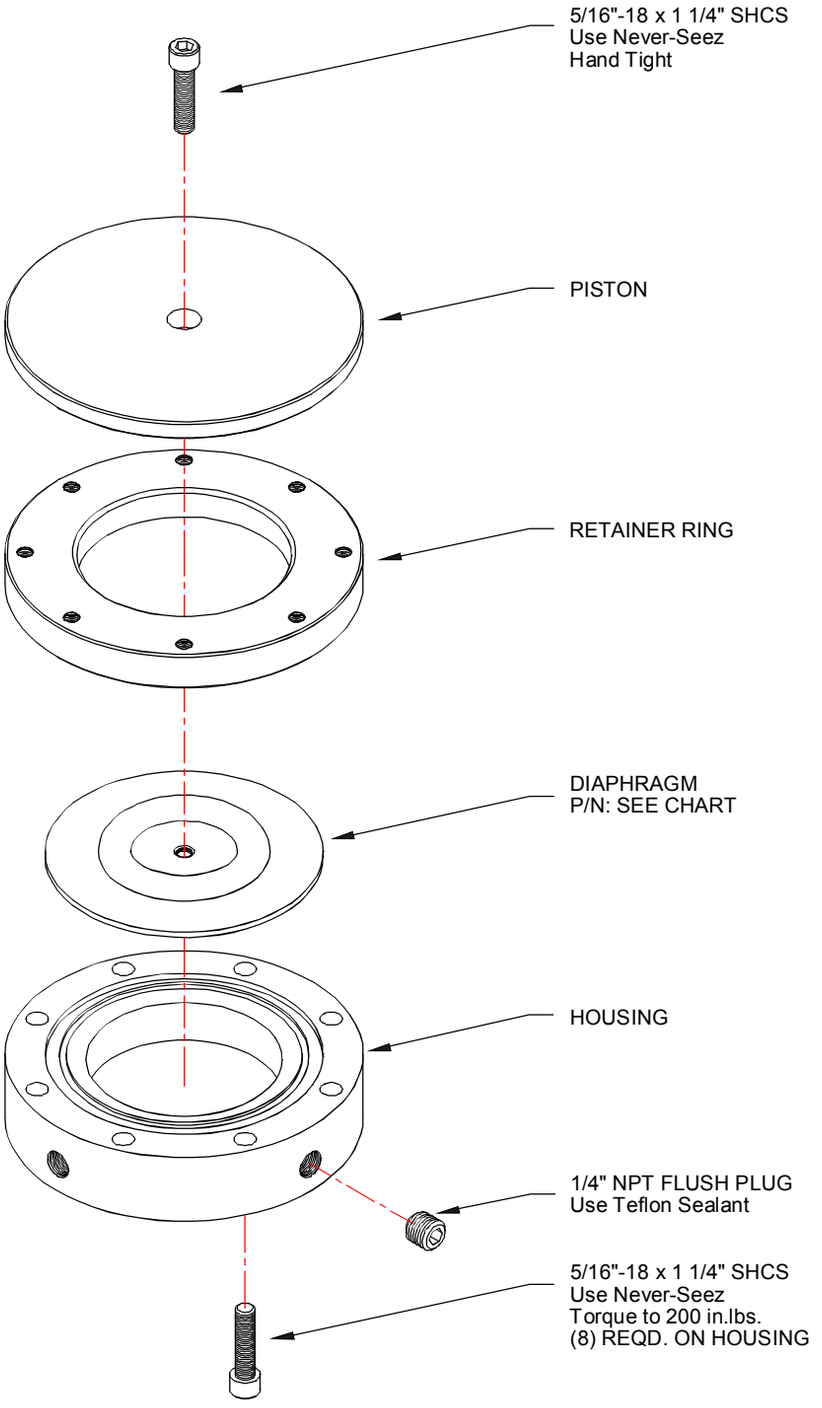
Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
CRSS20009	REMOTE OPERATED RELIEF VALVE PANEL MOUNT	each	M18-D	1	_____
CRSS20011	RELIEF CARTRIDGE STERLING P/N: A04G2HZN	each	M18-D	1	_____
CRSS20029	LOCKWASHER 1/2" SS	each		8	_____
CRSS20031	HHCS 1/2"-13 X 1" SS	each		8	_____
CRSS20032	SHCS 1/4"-20 X 3/4" SS	each	M18-D	22	_____
CRSS20034	SHCS METRIC 10-24 X 2" SS	each	M18-D	20	_____
CRSS20036	JAM NUT 9/16"-18 MOD .200 T MODIFIED TO .200 THICK	each		1	_____
CRSS20038	DAMPENER KNURL KNOB	each	M18-D	1	_____
CRSS20039	Long DO3 valve handles Note: shorten original by 1"	each	M18-D	2	_____
CRSS20040	Short DO3 valve handles Note: shorten original by 2"	each	M18-D	3	_____
CRSS20060	SUSPENSION END SWIVEL MNT 20/21 SUSPENSION SYSTEM PICKLIST REQ.	each	M18-D	2	_____
CRSS20065	REVERSING PIN SAFETY HINGE MOUNTING PLATE	each	M18-D	2	_____
CRSS20067	REVERSING PIN 3 1/2 SPRING HINGE (DAVID'HW # N184-556)	each	M18-D	2	_____
HTS15017	6 CU IN ACCUMULATOR- AM6	each		1	_____
VS4BUBF7	PILOT OPERATED SELECTOR	each		1	_____

CLINCHER® LOAD CELL and TORQUE GAUGE ASSEMBLIES

The **CLINCHER®** Tong and Backup are available in versions which accommodate compression load cells or tension style load cells. All information contained in this Technical Manual refers to products which utilize compression load cells. Contact SUPERIOR for information concerning products using tension load cells.

Part Number	SM80-38.8C
Torque Rating	80,000 ft lbs
Handle Length	38.8 inches
Loadcell Type	25 Sq. In. Compression
Loadcell Manufacturer	SUPERIOR MANUFACTURING & HYDRAULICS
Torque Gauge Mfr.	**CLINCHER®**
Torque Gauge Size	8"
Assembly Documentation	Calibration Certificate

CLINCHER® Load cells and Torque Gauges are produced by several manufacturers. The information provided by MD TOTCO or Acadiana Oilfield Instruments may not be applicable to all torque gauges or load cells. This reference information is provided with the permission of MD TOTCO and Acadiana Oilfield Instruments.



LOAD CELL SIZE	DIAPHRAGM P/N
6.44 SQ.IN.	CLC203
8.0 SQ.IN.	CLC205
12.0 SQ.IN.	CLC206
16.1 SQ.IN.	CLC207
25.0 SQ.IN.	CLC208

COMPRESSION LOAD CELL

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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REV. #	LOG #	DATE
1		07/03/02

REF: S:\Equip Manuals\Dwgs\Load Cell Comp rev1.wpg

CLINCHER® LOAD CELL and TORQUE GAUGE ASSEMBLIES

To request copy of
Compression Torque System
Technical Manual,
please contact:

Superior Manufacturing & Hydraulics
4225 Hwy. 90 East
Broussard, LA 70518
Phone: 337-837-8847
Fax: 337-837-8839
www.superior-manf.com

SECTION 14 MOTOR SERVICE MANUALS

To request copy of Rineer Motor Service Manuals, please contact:

Superior Manufacturing & Hydraulics
4225 Hwy. 90 East
Broussard, LA 70518
Phone: 337-837-8847
Fax: 337-837-8839
www.superior-manf.com

SECTION 15 CONTROL VALVE TECHNICAL DATA

To request copy of Control Valve Technical Data, please contact:

Superior Manufacturing & Hydraulics
4225 Hwy. 90 East
Broussard, LA 70518
Phone: 337-837-8847
Fax: 337-837-8839
www.superior-manf.com